GAS JOURNAL

LIGHT . HEAT . POWER . BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

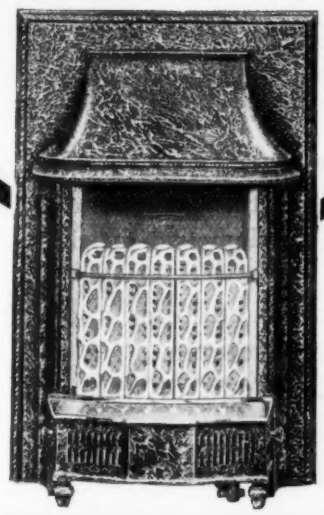
Vol. 203. 85th Year. LONDON, SEPTEMBER 13, 1933. No. 3669. Price 1s.

FOR HIGHER HEAT RESISTANCE

Foochow

"500" ORIENTAL LACQUER

for GAS FIRES, etc.



Leading gas undertakings and stove manufacturers now use "FOOCHOW" for the artistic finishing of fires, cookers and other gas appliances. The beautiful "FOOCHOW" colourings can be used with complete confidence—"FOOCHOW" does NOT discolour under hardest normal usage conditions. TEST IT YOURSELF. Samples with pleasure.

A good gloss finish can be obtained by spray with "Foochow" Oriental Lacquer in one coat

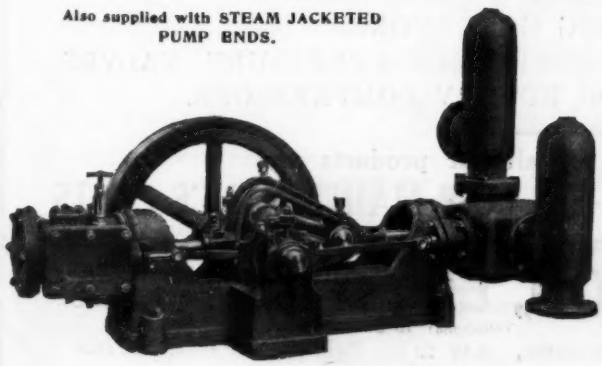
DONALD MACPHERSON & CO., LTD.
LONDON AND MANCHESTER

H.C.T.

THE "RELIABLE" STEAM PUMP

for TAR and all THICK FLUIDS.

Also supplied with STEAM JACKETED PUMP ENDS.



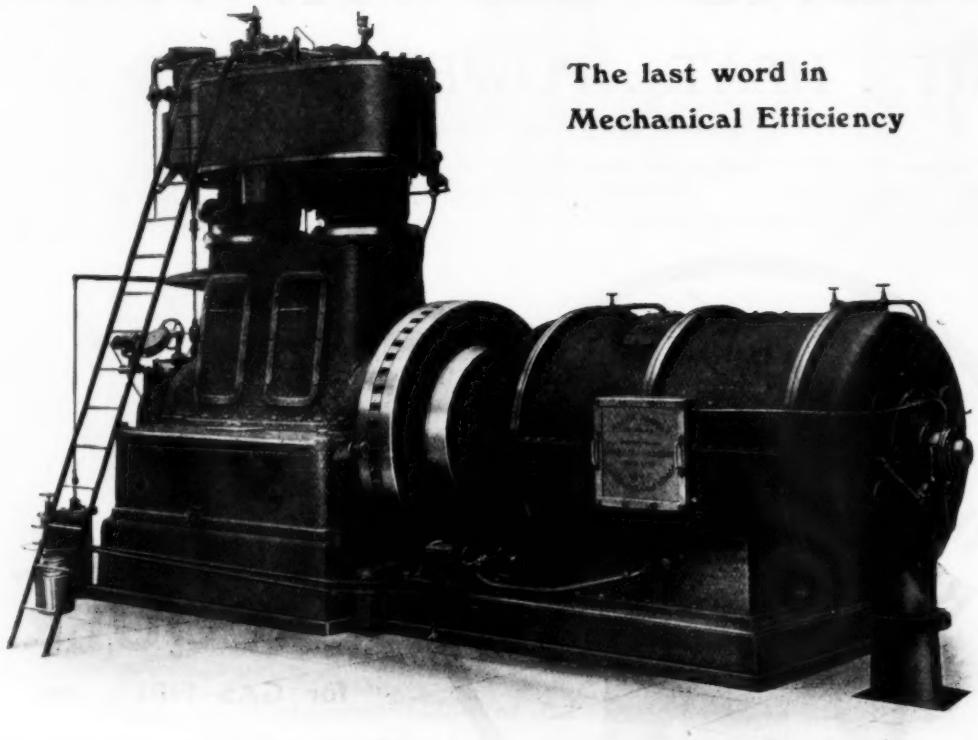
Write for No. 8 Catalogue.

Telegrams: "EVANS, WOLVERHAMPTON."
National Telephone Nos. 20864 and 20865.

London Office:
109, KINGSWAY, W.C. 2.
Telephone: HOLBORN 1091
Telegrams: "DRYOSBO, WESTCENT, LONDON."

JOSEPH EVANS & SONS
(WOLVERHAMPTON), LTD.,
Culwell Works, WOLVERHAMPTON.

CRANKLESS COMPRESSORS



The last word in Mechanical Efficiency

Steam Driven Michell Crankless Gas Compressor, 350,000 c.ft. per hour, 20 lbs. pressure.

The CRANKLESS COMPRESSOR embodies distinctive features ensuring minimum frictional losses and very high volumetric efficiency.

ADVANTAGES:—

Small space—consequently small building and foundation.
Wide variation of speed and volume.
Constant pressure over wide range of volumes.
High speed and steady discharge.
No Crank or Connecting Rod bearings requiring periodic adjustment.
Perfect balance and complete absence of vibration.

AN IDEAL TYPE FOR TRANSMITTING COKE OVEN GAS FOR TOWN SUPPLY

Other Specialities:—

DISTRICT REDUCING GOVERNORS.
PHŒNIX DOUBLE-FACED HIGH-PRESSURE VALVES.
BOOSTING FANS and ROTARY COMPRESSORS.

The outstanding features of all our products are

RELIABILITY—LONG SERVICE—and LOW MAINTENANCE COSTS

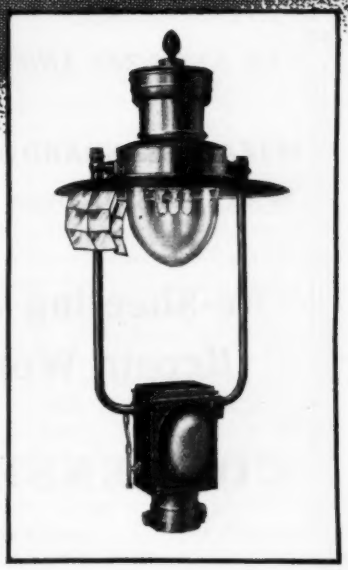
GEO. WALLER & SON, Ltd. PHŒNIX IRON WORKS, STROUD, GLOS.

Telegrams: "WALLER, BRIMSCOMBE." Telephone: 10 BRIMSCOMBE.

LONDON OFFICE: 149-150, PALACE CHAMBERS, S.W. 1. Telephone: WHITEHALL 5526.

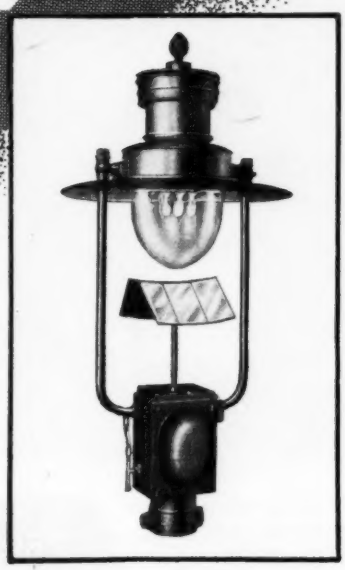
AGENTS FOR SCOTLAND MESSRS. MILNE & MITCHELL, 75, BATH STREET, GLASGOW, C.2.

Did you see these at MARGATE?



The Upright
"ROCHESTER"
Lamp, with
"K" type DIRECTIONAL
REFLECTOR.

Six of these were to be seen adjacent to the QUEEN'S HIGHCLIFFE HOTEL.



The Upright
"ROCHESTER"
Lamp, with
"MULTI-RAY"
REFLECTOR.

Twelve of these were to be seen in ETHELBERT ROAD.

These installations provided an excellent opportunity to observe the remarkable improvement effected by either type of reflector and to compare the merits of both.

REFLECTION BOOKLET FREE ON REQUEST.

MARGATE
one of the best lighted seaside resorts - uses
SUGG'S LAMPS

SUGG WESTMINSTER

William SUGG & CO., Ltd., Ranelagh Works, Chapter Street, Westminster, S.W. 1.

We Specialise in

GASHOLDERS

OF ALL SIZES AND TYPES

SPIRAL: STANDARD GUIDED: WATERLESS (Klonne Patent)

Re-Sheeting and Repair Work

CONDENSERS

PURIFIERS

WASHERS

SCRUBBERS

WATER-GAS PLANT

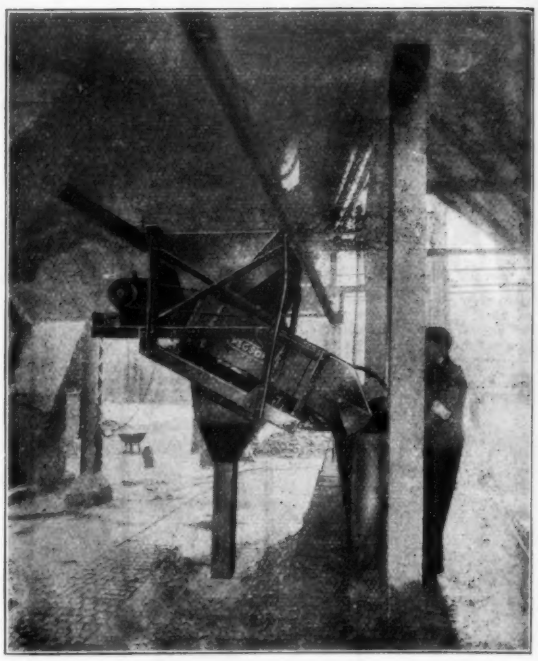
PRODUCERS FOR GASIFYING COKE BREEZE

(Fitted with the Koller Patent Revolving Grate)

ASHMORE BENSON PEASE & CO. LTD.

PARKFIELD WORKS
STOCKTON-ON-TEES

Debreezing Screens



Portable unit on overhead runway in Northern Gasworks consisting of "Live-wire" Debreezing Screen and bagging chute.

OF PROVED EFFICIENCY

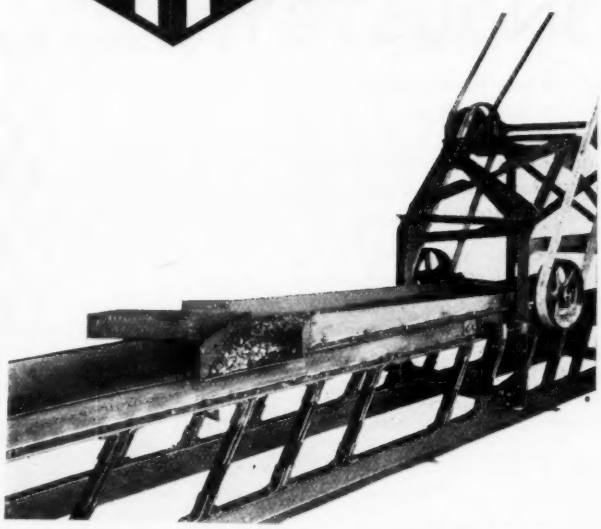
An increasing number of Gasworks are installing Pegson Primary and Debreezing Screens. The number of repeat orders placed after a period of satisfactory operation proves definitely the high efficiency of these inexpensive machines.

PEGSON LIMITED
COALVILLE
LEICESTERSHIRE

BRITISH BUILT

Have you heard about PEGSON-TELSMITH VIBRATING SCREENS?

COKE SCREENS.



"H.H." Coke Screen at Wolverhampton Gas Works.

THE ONLY LOGICAL WAY IN WHICH TO SCREEN COKE IS TO SEPARATE THE LARGER SIZES FIRST AND TO ELIMINATE THE BREEZE LAST OF ALL. This is the method we adopt in the "H.H." Coke Screen, which is characterised by very high screening efficiency, over 95% being obtained in actual practice. The power consumption of this screen is much lower than that required for rotary screens, while the machine acts also as a conveyor, thus facilitating distribution of the graded products into bunkers. ***The only moving part is the shaft carrying the two unbalanced pulleys which actuate the screen,*** there being no cams, rockers, or other complicated parts to get out of order. These screens are built in lengths up to 25 ft., two or more screens being arranged in series where greater lengths are to be covered. Each screen is designed to suit the particular number of grades and the distribution required.

HUNTINGTON, HEBERLEIN & CO., LTD.
47-51, KING WILLIAM STREET, LONDON, E.C. 4.

ENTIRELY NEW PATCHING CEMENT

1. "E.B. Patch" for short.

* *

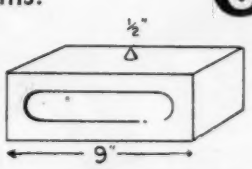
2. For either Hot or Cold repairing.

* *

3. "E.B. Patch" is a plastic Cement ready for use with a trowel, "gun," or paddle.
   Can be reduced **with water** for dipped joints, or spraying.

* *

4. Put up in 28 lb. or 56 lb. tins. 1 cwt. Drums, and 7 cwt. Barrels.



5. "Refractoriness." Independent Tests.
   (a) Raw materials (as quarried). Authority—National Physical Laboratory. Softening point—1670° C.
   (b) "E.B. Patch" (as manufactured). Authority—H. Silvester, B.Sc., F.I.C. Softening point—1670° C.
   (c) "E.B. Patch" (as manufactured). Authority—H. Silvester, B.Sc., F.I.C. First sign of glazing at corners Cone 28—1630° C.

* *

6. "Stickability" is such that a cone ½" area will lift a 9" brick.

E.B. REFRACTORY CEMENT CO. LTD.
147, CORPORATION STREET, BIRMINGHAM
'Phone: Central 5809

"EXPAMET" and EXPERIENCE *for* THE GAS INDUSTRY

"EXPAMET" Expanded Steel has been in ever-increasing use for more than 40 years. It has become invaluable to the Gas Industry, chiefly as reinforcement for concrete, brickwork, and plasterwork; but it has been applied successfully also for Openwork Flooring and Partitions, Gas Purifier Grids, Coke Screens, Window Guards, and for many other purposes.

There is real value in the practical experience acquired during so many years' trading; and it is always at the disposal of those who care to take advantage of it.

THE EXPANDED METAL COMPANY, LTD.

Patentees and Manufacturers of Expanded Metal
Engineers for all forms of Reinforced Concrete and Fire-resistant Construction

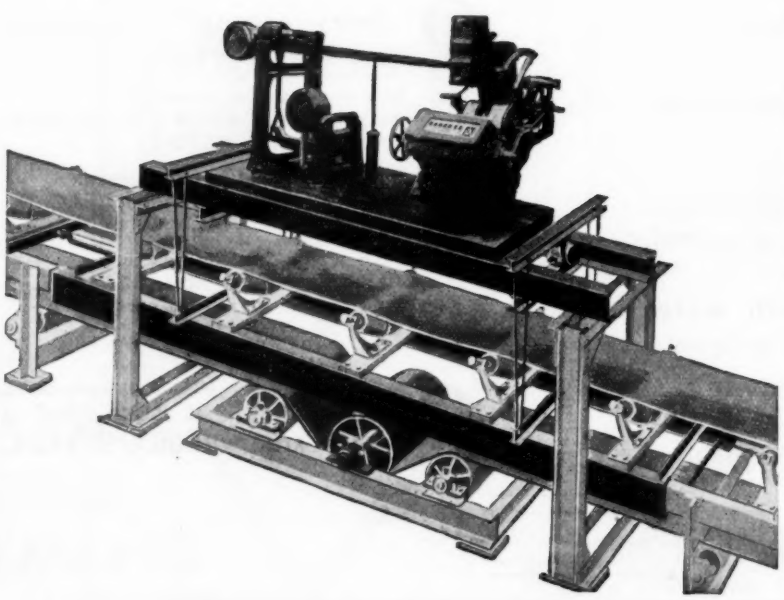
BURWOOD HOUSE, CAXTON STREET, LONDON, S.W.1
Works: West Hartlepool. Established over 40 years.

SIZES OF MESHES:

All titles for sizes of meshes are based on the measurement of the shortway of the diamond. "Expamet" of various weights is manufactured in mesh sizes—
6", 3", 2", 1½", 1", ¾", ½", ⅜", ¼", 3/16", ⅛"

"EXPAMET" EXPANDED METAL
BRITISH STEEL
BRITISH LABOUR

THE "BLAKE-DENISON" AUTOMATIC CONTINUOUS WEIGHER AND RECORDER



will furnish you with accurate weight records of coal or coke carried over Conveyors of the Belt or Bucket type, and thus enable leakages to be detected and stopped.

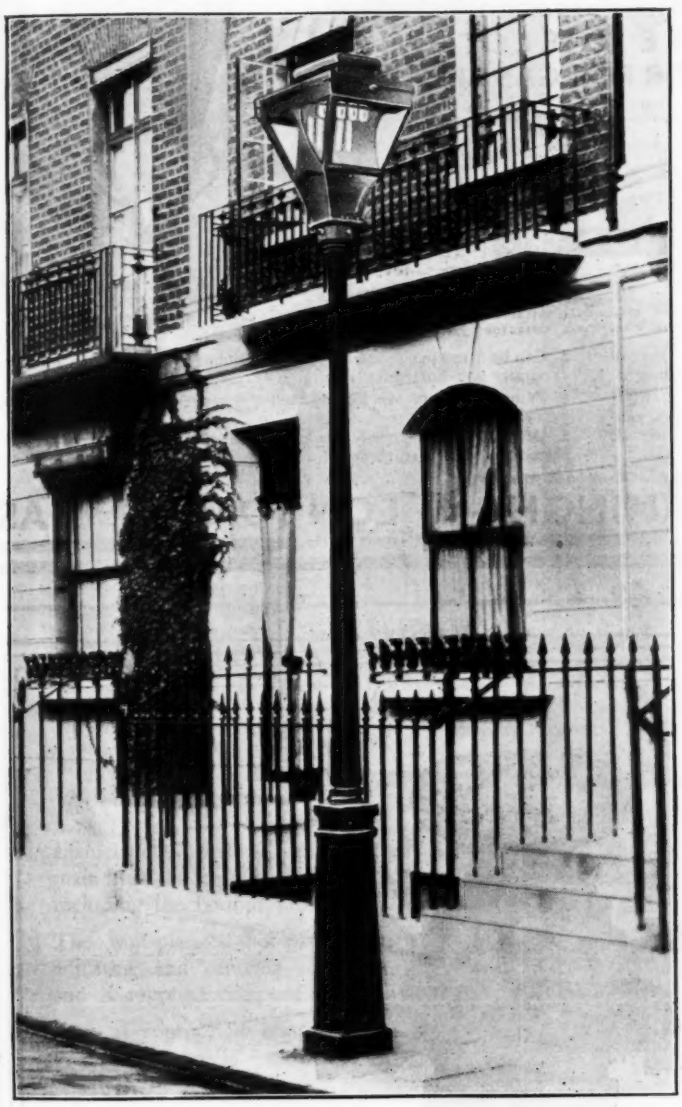
This machine is at work at many important Gas Works and Coke Ovens throughout Great Britain.

We shall be pleased to send you a Catalogue giving full information on request.

SAML. DENISON & SON LTD., HUNSLAKE, LEEDS

WE ARE ALSO MAKERS OF WEIGHBRIDGES, CRANE WEIGHERS, TESTING MACHINES, &c.

Don't lose your Street Lighting Load



THE "KEMPAR" STREET LAMP

Registered design No. 779715.
Provisional patent 1938/33.

is the Lighting Unit with a Future

Something New and Attractive to look upon

WITH A MAXIMUM INTENSITY 70/80° FROM THE VERTICAL

300 CANDLE POWER
per Bijou nozzle
IS A SAFE BASE FOR CALCULATING THE MAXIMUM INTENSITY

New Catalogue and Brochure Now Ready

C. H. KEMPTON & CO. LTD.

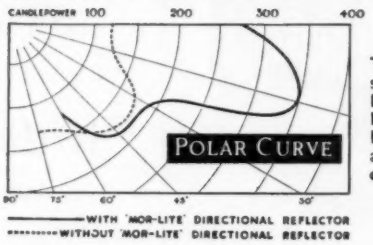
Stangate House
235, Westminster Bridge Road, London, S.E. 1

Branch Office and Service Depot: 70/72, BENNERLEY ROAD, S.W. 11

DOES 100% INCREASE IN ILLUMINATION APPEAL TO YOU?

TYPE G LANTERN
WITHOUT
MOR-LITE REFLECTOR

The Parkinson
MOR-LITE DIRECTIONAL
REFLECTOR FOR GAS LIGHTING



The curve shows the Directional Increase in Illumination at no extra cost for Gas

TYPE G LANTERN
WITH
MOR-LITE REFLECTOR

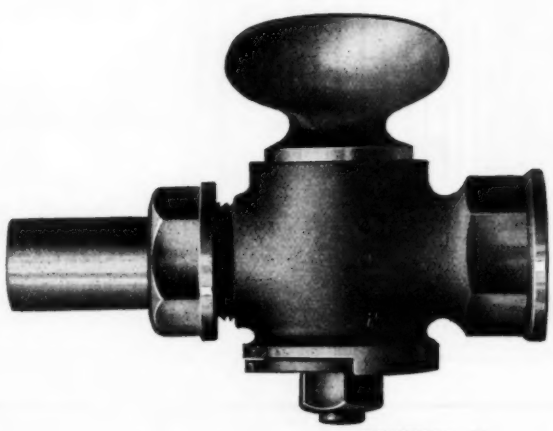
1. THE "MOR-LITE" DIRECTIONAL REFLECTOR increases the candle power by reflection at low angles where light is most needed.
2. Using a Twin Burner with No.2 medium mantle there is a directional increase from normal 150 c.p. to over 350 c.p. in illumination.
3. Can be fitted in a moment. Can be instantly adjusted both vertically and horizontally to give maximum light service.
4. Wing reflectors can be adjusted by wing nuts to meet every need.
5. Wings lift off instantly for Lamp Cleaning and are replaced without disturbing adjustments.

Send for sample and price list.

W. PARKINSON & CO., BIRMINGHAM · LONDON & BELFAST

INCORPORATED IN PARKINSON & COWAN (GAS METERS) LTD.

Quality



DESIGN No. 50

GUN-METAL MAIN COCKS

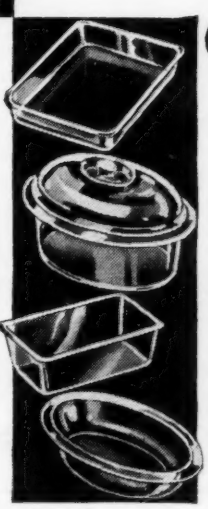
GEORGE ORME & CO.
(Branch of Meters Ltd.)
ATLAS METER WORKS
OLDHAM

We shall be pleased to receive enquiries for
SAMPLES & PRICES

Put these in your Showrooms

Fireproof Glass Door

Glass Ovenware



THIS up-to-date Vulcan Cooker is bound to make an instant appeal to your customers. The addition of an ARMOURPLATE GLASS door is a practical improvement, for it enables one to see the food in process of cooking, without opening the oven door and letting cold air rush in. The double glass door, heat-resisting and practically unbreakable, is constructed with an intervening air space, obviating condensation of moisture on the glass and maintaining an efficient insulation of the oven heat.

The "Equi-heat" oven, packed and enamel-lined, gives a uniform heat throughout, and the Vulcan Regulator (automatic oven-heat controller) maintains the correct temperature for all classes of cooking. The whole oven space is available for use, including the bottom plate.

The well-planned hot-plate contains three boiling burners and reversible griller. All taps have patent self-adjusting and centring injectors. The stove is finished inside and outside in "Ceramic" porcelain enamel, and is supplied complete with stand, plate-rack, splasher-plate, and chromium-plated towel rail.

And, as appropriate equipment for this modern glass-panelled Cooker, a set of four pieces of Orlak Fireproof Glass Ovenware is included.

VULCAN STOVES

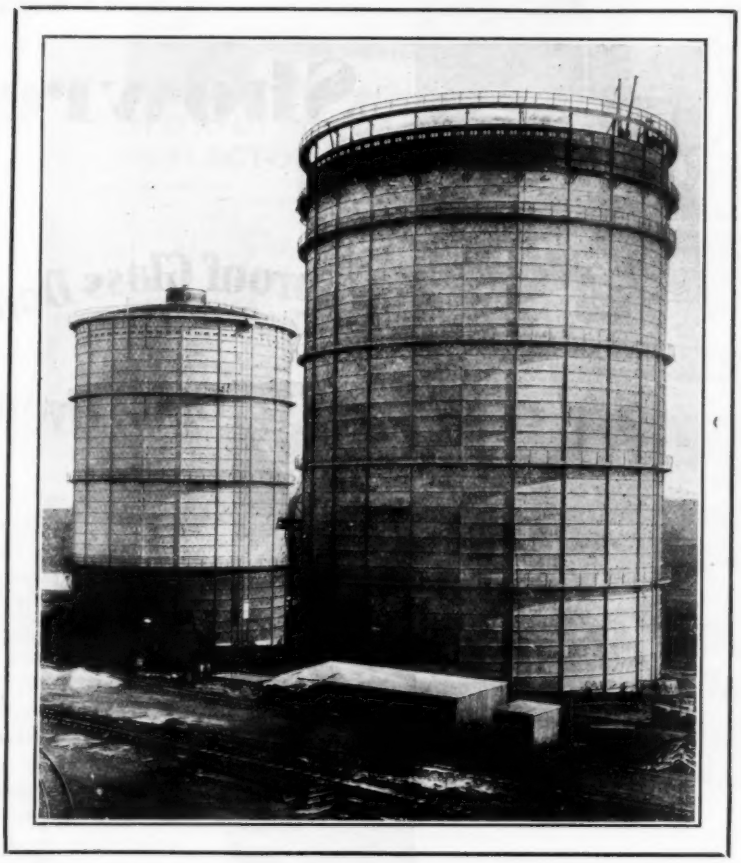
***The* VULCAN COOK BOOK**

Every housewife will want a copy of this inspiring Cook Book, as practical and attractive as the Vulcan Cooker itself. Send to us for a specimen copy and full particulars regarding this helpful sales aid.

THE VULCAN STOVE COMPANY LTD. EXETER

51 WATERLESS (KLONNE) GASHOLDERS

COMPLETED OR UNDER CONSTRUCTION.



VIEW OF 2 KLONNE GASHOLDERS AT PRETORIA, SOUTH AFRICA, OF 2 MILLION AND 1 MILLION CUBIC FEET CAPACITY.
Erected by Ashmore, Benson, Pease, & Co., Ltd.

DRY GASHOLDERS LTD.

39, VICTORIA ST., WESTMINSTER, LONDON, S.W. 1.

LICENSED MANUFACTURERS:—

SAML. CUTLER & SONS, LTD., 39, Victoria St., Westminster, S.W.1.

C. & W. WALKER, LTD., Wellington, Salop.

ASHMORE, BENSON, PEASE, & CO., LTD., Stockton-on-Tees.

NEWTON CHAMBERS & CO., LTD., Thorncliffe Ironworks, Nr. Sheffield.

THOS. PIGGOTT & CO., LTD., Atlas Works, Spring Hill, Birmingham.

THE HORSELEY BRIDGE & ENGINEERING CO., LTD., Tipton, Staffs.

on the one hand—

and on the other—

MORRIS-COMMERCIAL

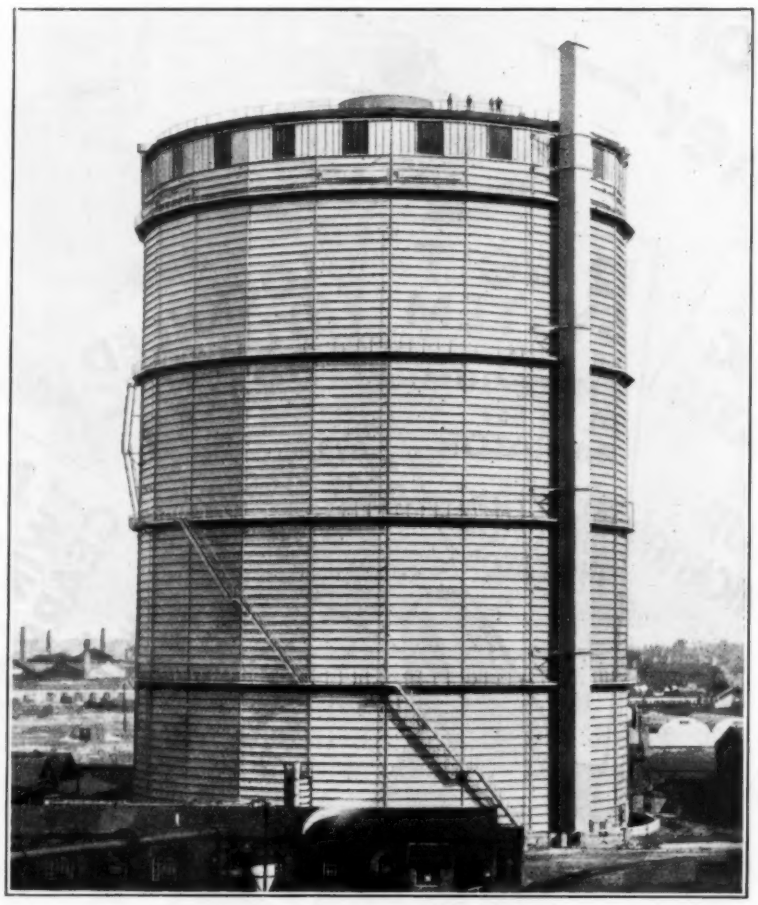
ADDERLEY PARK 4 OR 6 BIRMINGHAM 8.

THE LARGEST BRITISH MANUFACTURERS SPECIALISING EXCLUSIVELY IN COMMERCIAL VEHICLES

Complete range of 30-cwt., 2-ton and 3-ton vehicles. Chassis prices ranging from £198. Send for Catalogue G.J.

WATERLESS (M·A·N) GASHOLDERS

The Waterless Gasholder illustrated below exemplifies the speedy erection possible with this type, its adaptability to existing underground tanks, and the greatly increased capacity thereby obtainable without additional ground space.



This 4,000,000 cub. ft. M.A.N. Waterless Holder replaces a Telescopic Holder of only 1,000,000 cub. ft. capacity. Demolition of old Gasholder was commenced in January; concrete base over existing tank finished in April, and the new "Waterless" completed in November of same year.

LESS THAN TWELVE MONTHS FOR THE COMPLETE CONTRACT— DISMANTLING, FOUNDATION WORK, AND NEW GASHOLDER.

LATEST ORDERS FOR M·A·N WATERLESS HOLDERS:—

Britain: 500,000/1,000,000 cub.ft. for new Steel Works at Corby.
Germany: 175,000 cub. metres (say, 6,180,000 cub.ft.) for Ruhrgas A.G.

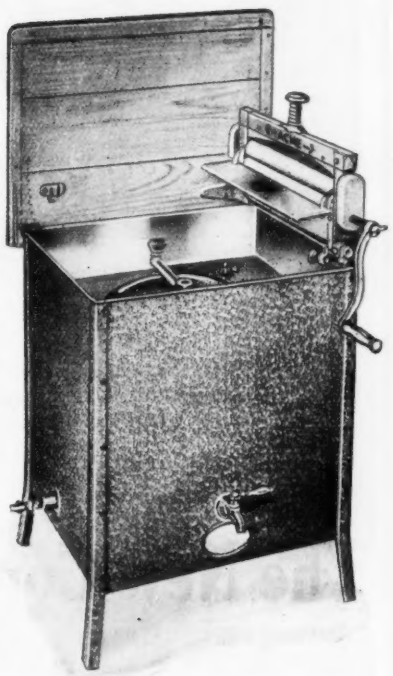
British Empire Licensees:

WATERLESS GASHOLDER CO., LTD.

13, ROOD LANE, LONDON, E.C. 3.

Nothing to Beat them!

ECONOMIC WASHING MACHINE



A combined Gas Boiler, Washer, Table and Wringer. Its robust construction and design ensure maximum work on wash-days. Apart from its utility it is attractive in appearance, being finished in mottled porcelain enamel with chromium plated tap.

This machine is now supplied with the patent tap shown in the No. 18 boiler illustrated below.

Note neat and compact appearance when closed.

ECONOMIC No. 18 Square Mottled GAS BOILER

Capacity 10 Gallons

Entirely new design, fitted with an extra strong copper pan, square cast aluminium top rim with copper condenser fitted in back portion, and a hinged copper lid. The outer casing is also square and is made from sheet steel, porcelain enamelled. **A notable feature is the Economic Patent Full-Bore Tap, which Swivels Absolutely Clear when not in use.** The Boiler is complete with wooden top (which makes a handy small table) but can be supplied without if desired.

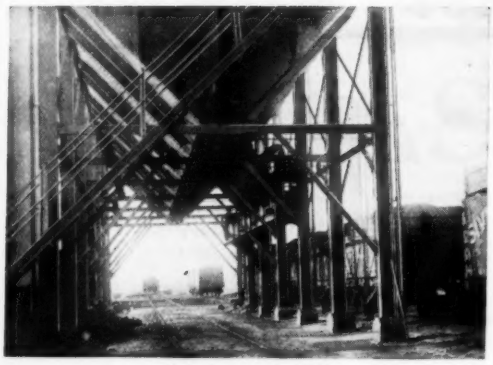
Showing Boiler with Wooden Top.

ECONOMIC

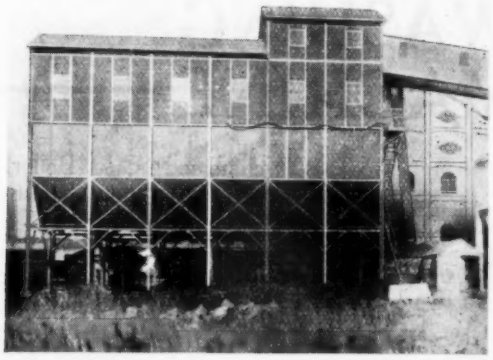
GAS BOILER CO., LTD.

Junction Mills, BURNLEY

MODERN COKE SCREENING AND GRADING PLANTS



All plants designed to include modern up-to-date units.

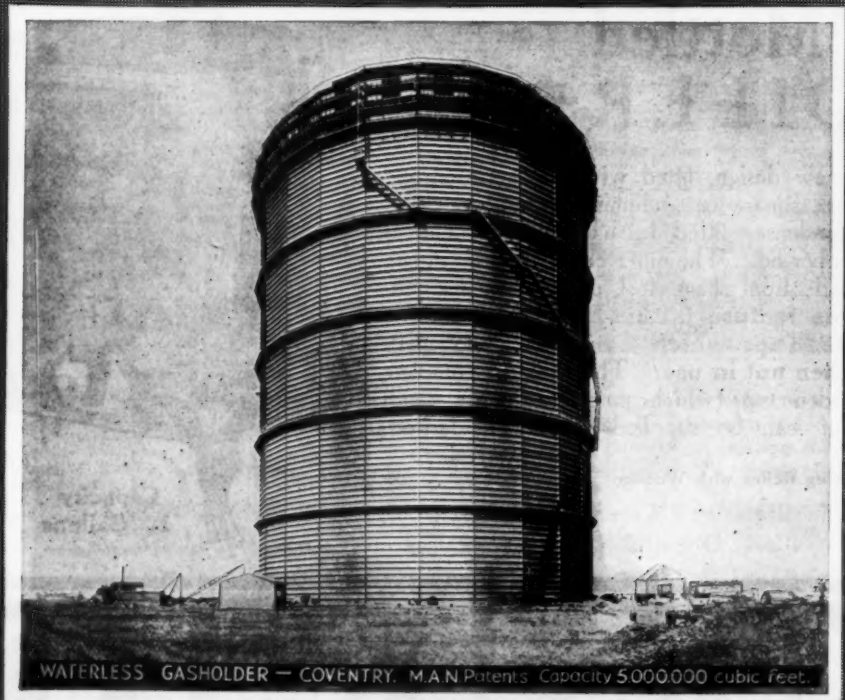


Our Technical Staff is at your service to prepare designs to suit local conditions.

Your enquiries are invited.

The New Conveyor Co., Ltd., Smethwick

Telephone: 0801 SMETHWICK — Near Birmingham — Telegrams: "APTITUDE, BIRMINGHAM."



WATERLESS GASHOLDER — COVENTRY. M.A.N. Patents Capacity 5,000,000 cubic feet.

GASHOLDERS AND TANKS OF ANY SIZE AND DESIGN

FRAME GUIDED SPIRAL. WATERLESS (M.A.N. PATENTS)

LONDON OFFICE: 5, VICTORIA ST. S.W. 1.

PURIFIERS, STRUCTURAL STEELWORK
WELDED AND RIVETTED STEEL PIPES, BOILERS

CLAYTON SON & Co LD., MOOR END, HUNSLET, LEEDS

● This photograph indicates the decorative possibilities of the "TURNALL" Glazed Panels, here used as an electric fire surround and hearth. With a highly glazed finish which is exceptionally hard and non-brittle, "TURNALL" Glazed Panels have extraordinary resistance to heat and moisture. For these reasons, as well as for their attractive colours and designs, they are admirable for the panelling of walls for splash backs, bath panels, table tops, gas and electric fire surrounds, etc.

"TURNALL" Oak-Grained Asbestos Panels are also shown in the photograph, providing a panelling which is remarkably effective in use and appearance.

SOLE DISTRIBUTORS:

ASBESTOS CEMENT BUILDING PRODUCTS LTD.

TRAFFORD PARK
MANCHESTER
'Phone: Trafford Park 1981

ASBESTOS HOUSE, SOUTHWARK ST.
LONDON, S. E. 1
'Phone: Hop. 4040

BIRMINGHAM: 14, New Street.
'Phone: Midland 0245

GLASGOW: Castle Chambers, 65 Renfield Street.
'Phone: Douglas 2006

NEWCASTLE-ON-TYNE: Collingwood Buildings.
'Phone: Central 25736

BRISTOL: West India House, Baldwin Street.
'Phone: Bristol 25743

"TURNALL" Glazed Panels

Φ T.G.1

NEWBRIDGE
GAS CONTROLLERS

Careful thought and experience in design, the best of British workmanship and materials, allied to the most up-to-date production and inspection methods, result in the utmost efficiency from Newbridge Controllers.

Install them and improve your street lighting.

Let us submit Samples now for test under actual working conditions, together with quotation and catalogue.

Type 3A/UNI-15 day run
For "square" lanterns

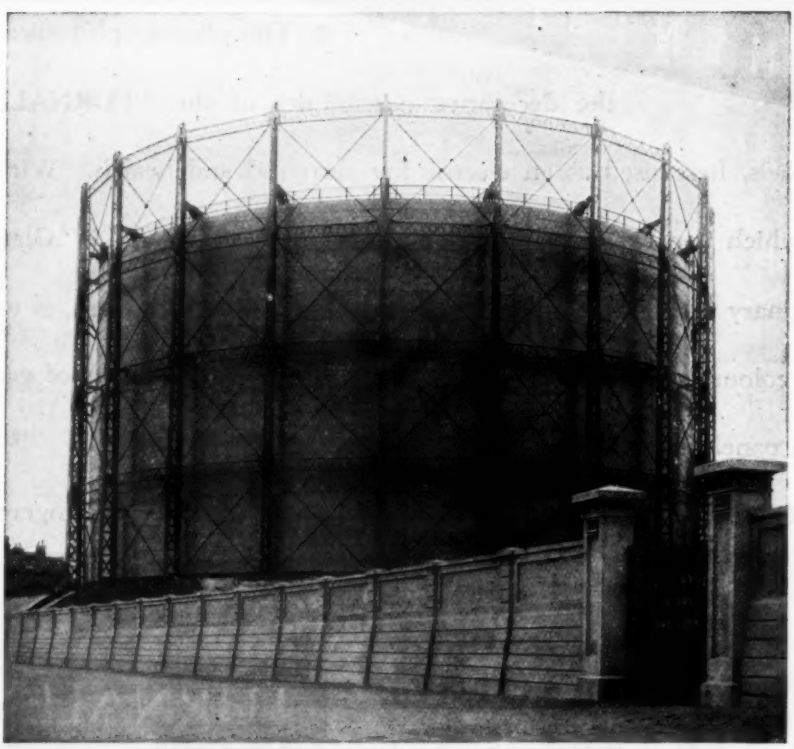
They SELL because they EXCEL.

Newbridge Gas Switches make gas as convenient as electricity for indoor lighting, with the advantage that the *lights may be dimmed.* They are fully guaranteed and will help you to retain your domestic lighting load. Flush hand controls and Duplex sets for two-way switching are available at a slight extra cost.

Stock, recommend and SELL this modern development of gas lighting. Catalogue post free on request.

NEWBRIDGE
POSITIVE DISTANCE GAS SWITCHES

The HORSTMANN GEAR COMPANY Ltd.
Automatic Lighting Engineers
NEWBRIDGE WORKS - BATH



AT CAMBRIDGE.—3 MILLION C.FT. CAPACITY

GAS HOLDERS

GUIDE FRAMED
AND
SPIRAL GUIDED
WITH OR WITHOUT
STEEL TANKS
WATERLESS (KLÖNNE) GASHOLDERS
HIGH PRESSURE GASHOLDERS

C. & W. WALKER, LTD. DONNINGTON, NR. WELLINGTON—SHROPS.

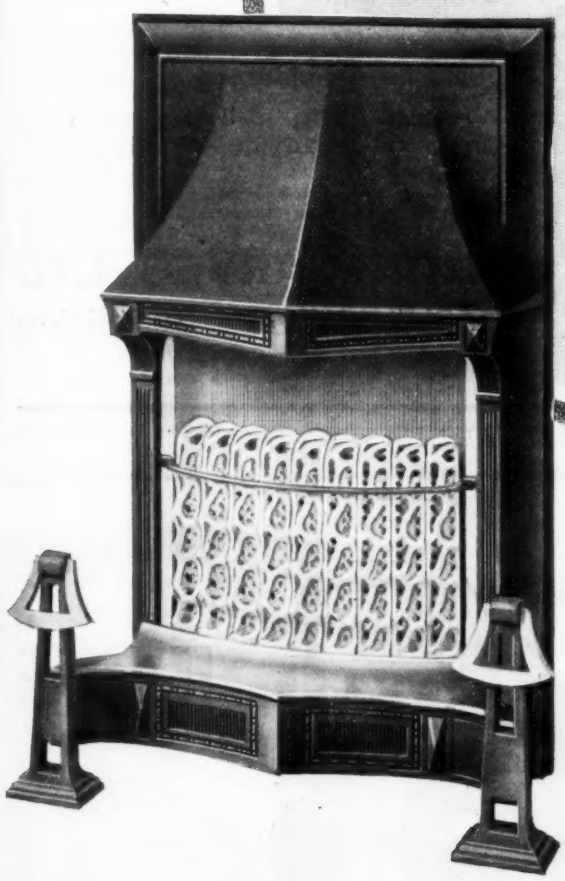
LONDON OFFICE: 70, VICTORIA STREET, WESTMINSTER, S.W. 1.

The Fletcher

"ALBANY"

Gas Fire

(with Drop-pattern "dogs")



IN their "Albany" fire Fletcher's have introduced a design of very striking appearance that is at the same time very much "at home" in an extraordinary variety of settings. This interesting series embraces square and round top models, each with and without the handsomely-designed "dogs." The illustration shows the "Albany" with the new drop-pattern "dogs."

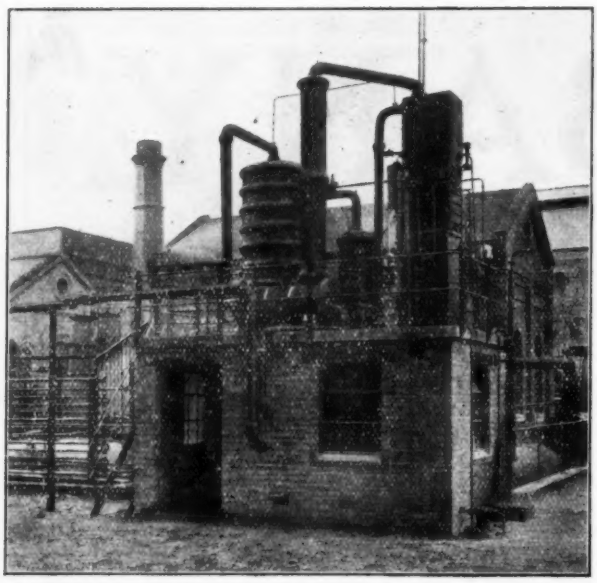
Manufactured by

FLETCHER, RUSSELL & CO., LTD.

4, Berners Street, London. Works: Warrington

(Radiation Ltd., Proprietors)

50,000 Gallons of BENZOLE
produced daily by
SIMON-CARVES BENZOLE PLANTS



Simon-Carves Benzole Plant at North Shields for the Newcastle-upon-Tyne and Gateshead Gas Co., recovering 275 gallons per day of 90% Benzole at 120° C.

Main steam and water feeds on Simon-Carves Benzole plants are thermostatically controlled, thus only occasional attendance is required on the plant.

Over 30 years' experience in the construction and operation of benzole plants ensures dependable and satisfactory operation.

Write to us for full particulars. Our expert advice is at your service.

SIMON-CARVES LTD
CHEADLE HEATH, STOCKPORT

ENQUIRIES INVITED FOR

Anglo's GAS OIL

ANGLO-AMERICAN OIL CO. LTD.
36 QUEEN ANNE'S GATE-WESTMINSTER-LONDON-S.W.I.
D.A.128.

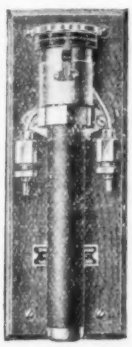


Fig. 678.—Room Type Thermogas Thermostat for gas-heated boilers, radiators, etc.

Drayton

Automatic Temperature Regulators

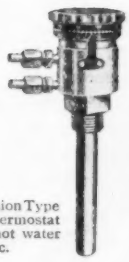


Fig. 658.—Immersion Type Thermogas Thermostat for tanks, vats, hot water boilers, etc.

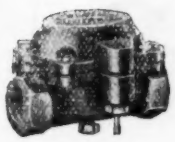


Fig. 659.—Thermogas valve for use with either type of Thermostat.

Satisfaction from automatic regulators depends very largely on a Thermostat of the correct design being selected according to the nature of the plant.

Drayton are well equipped to supply the right regulator for the job.

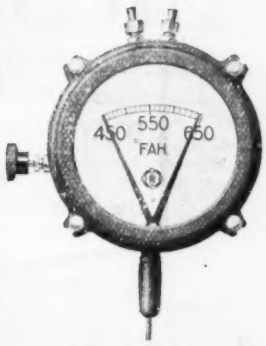


Fig. 1344.—A transmitting type regulator for temperatures up to 1000° Fahr. Can be supplied with temperature indicating pointer.

Drayton Thermogas Series of Regulators comprise a convenient means of controlling Central Heating Boilers, using the Type 678 Thermostat as Room Control and the Type 658 Thermostat as Boiler Control.
Both Thermostats actuate the same valve.

The DRAYTON REGULATOR AND INSTRUMENT Co., Ltd.
WEST DRAYTON, MIDDLESEX

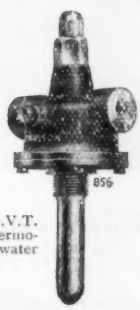
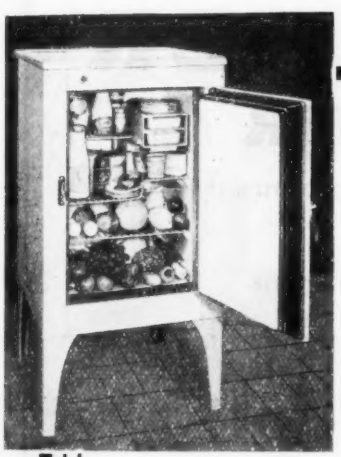


Fig. 856.—Type G.V.T. self-contained Thermostat for small water heaters, etc.

★ *HAVE YOU A COPY OF OUR CATALOGUE?*
Drayton automatics deal with every phase of gas heat control from temperature and pressure impulse. Only a few of the regulators available are mentioned here.

271



A DOMESTIC NECESSITY AND A SALES PROPOSITION IN ALL SEASONS

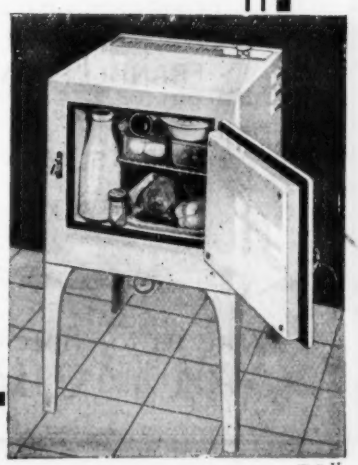
Because a refrigerator supplies ice cubes, chills drinks, etc., it must not be regarded solely as a summer time luxury. Its *main* function is the preservation of food and the protection of health. For this reason, and because food "taints" in an ordinary larder even in winter, a refrigerator is a necessity in the home *the year round.**

BY APPOINTMENT

Gas Refrigeration supplies a 365 days-a-year load. Tell your consumers of the need and value of gas refrigeration in all seasons.

The models shown are (top) the air-cooled Freezolux L.2 and the L.1 (£28/10/- and £19/10/- respectively). Like all Freezolux Refrigerators, they are motorless, automatic, and silent. Write for particulars.

* *The temperature in the kitchen during winter months is generally above 50° Fahr. (the safety line), due to cooking, closed windows, fires, etc.*



BRITISH MADE

FREEZOLUX

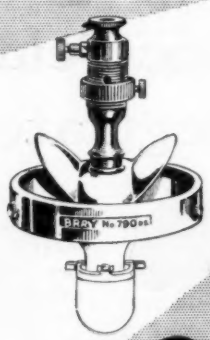
GAS - OPERATED REFRIGERATORS

ELECTROLUX LTD., 153/5, Regent Street, LONDON, W.1. Works: Luton, BEDS.

E.I.H.

The "No-Trouble" Burner

THE 790DS. BURNER is fitted with the BRAY SILENT REGULATOR and the BRAY PATENTED DIFFUSER.



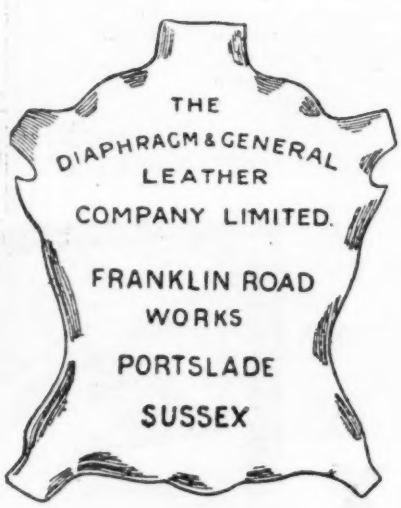
This combination is the most important advance in incandescent burner design for many years: IT BANISHES NOISE.

BRAY 790DS BURNER

GEO BRAY & CO LTD LEEDS

METER LEATHER
GOVERNOR LEATHER

(In the skin or cut to suit customers' requirements)



Oil Dressing for Diaphragms
No. A for Buffed Leather
No. B for Grain Leather

Specially prepared and Guaranteed

Write us for Special Contract Prices and Particulars of our Guarantee
C. M. W. TURNER, Managing Director.

FRASER & CHALMERS

(Robins System)

COAL & COKE HANDLING & SCREENING PLANT FOR OLDHAM CORPORATION

These new works, designed by the Borough Gas Engineer to co-ordinate and centralise the production of gas for Oldham, were opened recently by H.R.H. Prince George, K.G., G.C.V.O.

The complete coal and coke handling and screening equipment has been manufactured and erected by Fraser & Chalmers Engineering Works, the entire output of coke being screened and graded by F. & C.-Robins GYREX and VIBREX Screens and Rotary Grizzlies.

MADE IN ENGLAND

Manufacturers—

FRASER & CHALMERS ENGINEERING WORKS

(Proprietors: The General Electric Co., Ltd.)

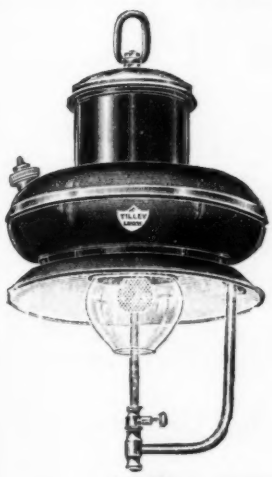
ERITH, KENT, ENGLAND

LONDON OFFICE: MAGNET HOUSE, KINGSWAY, W.C.

Associated with Robins Conveying Belt Co., of U.S.A.

STREET LIGHTING IN COUNTRY DISTRICTS

OUTSIDE THE AREA OF GAS SUPPLY



O.L. 50.

Outdoor Suspension Lamp
300 c.p. 77/6

BRITISH MADE THROUGHOUT

Street Lighting has frequently to be provided in districts where the cost of extending the gas service would be prohibitive. This difficulty can be overcome by installing Tilley Paraffin Vapour Lamps, which are self-contained and give an extremely brilliant light at almost negligible cost. We recommend—

THE TILLEY OUTDOOR SUSPENSION LAMP

Made in two sizes: 300 c.p. and 500 c.p.

BURNS ORDINARY PARAFFIN. WIND AND RAIN PROOF.

This method of lighting is being introduced by several Gas Undertakings with excellent results. The Lamps are very simple to manage and the cost of maintenance for 1000 burning hours (including paraffin) works out at considerably less than 20/- per Lamp. This is equivalent to—

4 HOURS LIGHT FOR 1d.

If required, we can supply a Lamp suitable for fitting inside existing lanterns.

Widely used by the leading Railway Companies all over the World.

Sample Lamp for testing purposes willingly sent without obligation to purchase.

THE TILLEY LAMP CO., HENDON, N.W.4.

Telephone: Hendon 8045 (2 lines).

Fire!

Are your works and vehicles PROPERLY PROTECTED?

A SPARK may leave your works in flames *to-morrow* . . . an overheated exhaust pipe reduce your valuable lorry to blackened scrap *to-morrow*. Take time by the forelock *to-day*. Equip your works and vehicles with VALOR FIRE EXTINGUISHERS. There's no "perhaps" about VALOR EXTINGUISHERS—they act at once, *killing* the fire effectively and with little effort. Easily handled and understood. Last for years and keep charges undamaged. Illustrated types are only representative of our large range.

Write for List 39V/51, or else visit our Showrooms at Bromford or London.

USED ALL OVER THE WORLD.

The VALOR Co., Ltd.,
Valor Works, Bromford, ERDINGTON, BIRMINGHAM, ENGLAND.
London: 120, *Victoria St., S.W.1.*
Buy British Goods.

E. 320.—Reversible Pattern. In 1, 2 and 3 gallon capacities. Special for export; formula for recharging being shown, saving sending to England for recharges.

Type E. 902.—1 quart size D.A. Pump, suitable for all Motor vehicles and Electrical Establishments. Kills a petrol fire. No risk of electrical shock.

VALOR
FIRE EXTINGUISHERS

E.12.

CONFIDENCE!

ROSS ON WYE
MALTON
ANNAN
REVERTED

FROM ELECTRICITY TO GAS

FOR STREET LIGHTING

THE COMPLETE EQUIPMENT WAS MADE AND SUPPLIED BY

MESSRS. FOSTER & PULLEN LTD.
BRADFORD

The VISCO-BETH DUST COLLECTOR

stops the coal dust nuisance and prevents risk of fire.

Instead of allowing coal dust to fly about and settle on buildings and plant, instal a Visco-Beth Dust Collector, and collect this dust where it originates—at the screening or coal breaking plant. Dust salvaged (up to 99%) in this way can be put into stock. Your buildings, too, will be cleaner and healthier and risk of fire will be eliminated.

The Visco-Beth Dust Collector is self-cleaning and simple and will run 24 hours a day without attention. Over 15,000 in use.

Write for our booklet on Dust Collection.

VISCO
ENGINEERING Co. Ltd.
STAFFORD ROAD, CROYDON, SURREY.

Also makers of Air Filters, Water Cooling Plant, Large Vacuum Cleaners, etc.

Telephone: Fairfield 4181/2/3. Telegrams: "Curtmit, Croydon."

E.1.H.

Gas Cleaning by ELECTRICAL PRECIPITATION

Recent orders completed or under construction

DETARRING

COKE OVEN GAS: The Nunnery Colliery Co., Ltd. 8 million cub. ft. per day.

WATER GAS: Tottenham & District Gas Co., Ltd. 6 million cub. ft. per day.

MIXED COAL & WATER GASES: William Coward & Co., Ltd., Perth Gas Works, Australia. 2½ million cub. ft. per day.

DEDUSTING

OXIDE ROASTER GASES: Coventry Corporation Gas Dept. 8 million cub. ft. per day.

WHESSOE DARLINGTON

All plants incorporate English Electric Co.'s High Tension Direct Current Generators.

Two new items of equipment produced by the Whessoe Company for the Gas and Coke Oven Industries:—

The W.W-D Electro Detarrer
(Whessoe Woodall-Duckham)

The Whessoe Electro Deduster

The success of these processes of electrical precipitation is indicated by the orders received. These notable additions to the range of Whessoe gas treating plant, feature high efficiency, a special insulator system and an unique system of generation of H.T. Direct Current.

For full particulars send for 24-page technical brochure now available on request. Inspections arranged by appointment.

THE WHESSOE FOUNDRY & ENGINEERING COMPANY LTD.
25, VICTORIA ST., LONDON, S.W.1. **DARLINGTON**

Peebles

SELF-LOADING STATION GOVERNOR

definitely improves Consumers' Service

Peebles' Self-Loading Station Governor will enable you to give better average District Pressure to consumers. With this the pressure is automatically increased as the load rises to overcome pipe friction, and decreased as the demand falls off.

Wherever it has been installed—and several Gas Companies use it—it has proved most successful.

The service to consumers has been definitely improved.

Full information will be sent on request to—

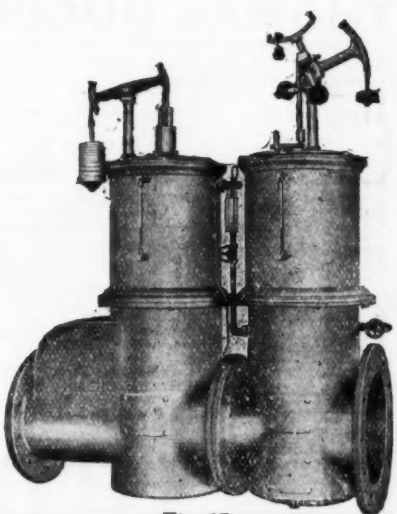


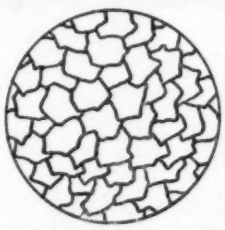
Fig. 27.

OTHER TYPES:
Weight - Loaded.
Pressure-Loaded.
Clock - Loaded.
Water-Loaded.

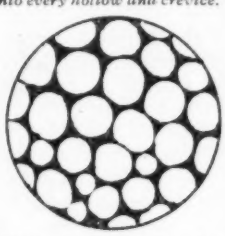
PEEBLES & CO. LTD.
Tay Works
Bonnington
EDINBURGH

USE IT

FLAKES LIKE SLATES



Foliac Silica-Graphite Paint is made up of flat flakes that overlap like slates on a roof, and pack into every hollow and crevice.



Ordinary amorphous paint covers like this! Being globular grains, they do not fit closely, nor do they cover adequately.

BECAUSE:

- The pigment is hard, foliated Silica-Graphite, which is inert to the fumes met with in Gas Works.
- The minute, slate-like flakes overlap and form with the tough "linoxyn" film of oil a protective covering which fills up all interstices and effectively withstands corrosion. (See illustrations alongside).
- It has excellent covering power and is easy to apply, thus reducing labour costs.
- It lasts for years, and results in all-round painting economy.

WRITE *for Free Booklet "Foliac Paints," and read 21 more concrete reasons why Foliac Silica-Graphite paint is the ONLY paint that can give adequate protection to all engineering structures.*

Foliac

SILICA-GRAPHITE PAINT

GRAPHITE PRODUCTS LTD.

52, CHURCH ROAD, BATTERSEA, S.W.11. *Telephone: 0521 Battersea.*

THOMAS BUGDEN & Co.,

India-Rubber and Airproof Manufacturers and General Contractors.
LARGEST MANUFACTURERS OF GAS MAIN BAGS.
Telegrams—"Airproof, Isling., London" Telephone—6147 Clerkenwell.

Contractors to H.M. Government.

Gas Bags for Repairing Mains.

PATENTEES OF THE
DENMAR BAG
Impervious to Main Liquor and Climatic Influences.

Round or Cylinder Shape.

Drain Rods & Appliances.

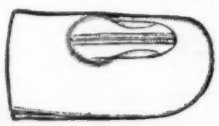
Bellows and Inflators, for Inflating Gas Bags.

Oilskin Clothing, Tarpaulins, &c., Tar Hose, Sewer Boots.

Hose, Tubing, and Sheet of Every Description.

Wading & Well Dresses.

Contractors' & Miners Woollen Jackets, Trousers, Hats, &c.



Stokers' Mitts and Gloves.

244, Coswell Road, LONDON, E.C.

COMPRESSORS & EXHAUSTERS

FOR AIR AND GAS.

See our Advertisement Next Week.

REAVELL & CO. LTD. IPSWICH.

Potential buyers in the Gas Industry can be reached more surely and economically through the "GAS JOURNAL" than by any other means.

LOCOMOTIVES

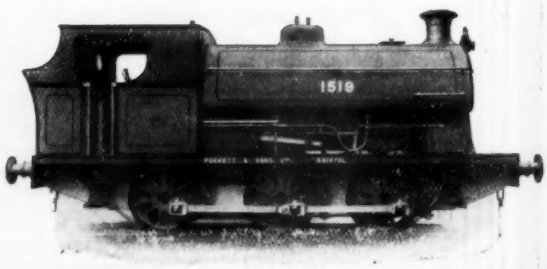
LOCOMOTIVES of all Sizes and Gauges specially constructed for Main and Branch Lines, Contractors, Docks, Gas-Works, Collieries, Iron-Works, Brick and Cement Works, &c. Locomotives of various Sizes always in progress for early delivery.

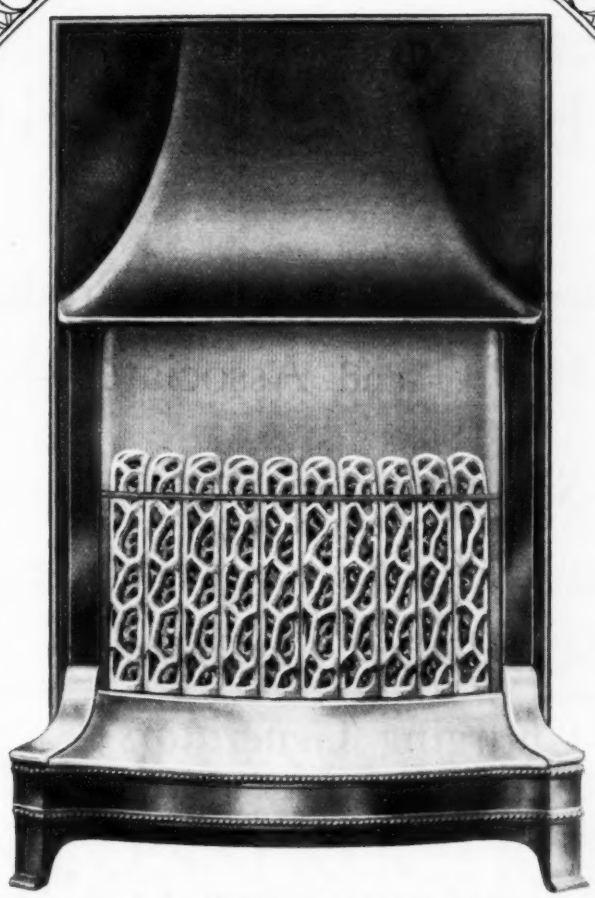
Photographs, Specifications, and Prices on Application.

PECKETT & SONS, LTD. Atlas Locomotive Works, BRISTOL.

Telegraphic Address: "PECKETT BRISTOL."

London Representatives: FERGUSON & PALMER, 9, Victoria St., Westminster, S.W. 1





Supplied in a Range of
8 delightful Lustre Finishes

RICHMONDS

"Marlborough"

Fitted with "BEAM" (Trade Mark) Radiants and "Injector Ventilator."

RICHMONDS
GAS STOVE COMPANY, Ltd.
WARRINGTON & LONDON

(Radiation Ltd., Proprietors)

Humphreys & Glasgow Ltd.

Carburetted-Water-Gas

Some Previous Revolutionary Productions of H & G and Associates:—

Self-Steaming Generators;
Safety Self-Operating Plant;
Self-Clinkering Generators;
Self-Charging Generators;
Back-Run Processes;
Complete-Gasification C-W-G Plant.

And Now—

Humphreys-Glasgow
Fortieth Anniversary Standards

129 Patents Current or Applied for in the United Kingdom alone.

Humglas House, Carlisle Place, London, S.W.1.

CONTENTS

EDITORIAL NOTES.

A GLANCE AT THE CONTENTS . . . 553
On the Way 554
Pleasure Lighting 554
William Young Memorial Lecture 554
Research on Horizontal Retorts 555
Unemployment Grants 555

Forthcoming Engagements 553
Personal 556
Obituary 556

NEWS OF THE WEEK.

Paragraphs 557
For Canada and the U.S.A. 557
Wales and Monmouthshire Association of Gas Engineers and Managers 558
S.B.G.I. Prize Winners 558

NEWS OF THE WEEK—(*continued*).

Gas for Propulsion of Motor Vehicles—Immediate Action Urged 558
Richmonds' Developments 558

SPECIAL ARTICLES, &c.

Banbury Gas Company—Centenary Celebrations 559
Waterless Gasholder Inaugurated at St. Helens—General Works Extensions . . 561
North British Association of Gas Managers—
Annual Meeting in Paisley 562
Social Events 563–64
William Young Memorial Lecture—Young, Beilby, and Some Experiments on the Carbonization of Coal. By F. S. Sinnatt, M.B.E., D.Sc. 565
The Gas Industry in France—Comparison with Other European Countries. By H. Laurain 564
Book Review 570

SPECIAL ARTICLES, &c.—(*continued*).

Association of Public Lighting Engineers—
Annual Meeting at Margate 571
Luncheon Speeches 571
Business Meeting 572
The Public Lighting of Margate. By H. V. Emptage 573
Lighting of Seaside and Health Resorts. By W. N. C. Clinch 574
Shipping, Engineering, and Machinery Exhibition 575

MISCELLANEOUS.

Gas Companies' Results 577
Corporation Undertakings' Results . . . 577

GAS MARKETS AND MANUFACTURES.

Stock Market Report 578
Current Sales of Gas Products 578
Trade Notes 578
New Capital Issues 578

Stock and Share List 579

For Advertisers' Index see End of "JOURNAL"—PAGE 585.

A UNIQUE & AMAZING METHOD OF OVEN CONSTRUCTION WHICH NO OTHER COOKER POSSESSES!

THE GOVERNOR-GENERAL GAS COOKER is the most striking advance in the development of the SINGLE BURNER OVEN.

THE PATENT BOTTOM FLUE by its ingenious method of construction compels the heat to circulate throughout the entire oven, giving a BETTER Heat Distribution before it leaves at the Bottom by means of the PATENTED DOOR FLUE. The Heat then takes its natural course up the flue in the door, along the passage over the dome of the cooker, and finally passing out of the flue outlet in the CORRECT POSITION at the top of the oven.

THE AUTOMATIC OVEN CONTROL ASSURES ECONOMICAL AND EFFICIENT COOKING SERVICE

GOVERNOR-GENERAL GAS COOKER

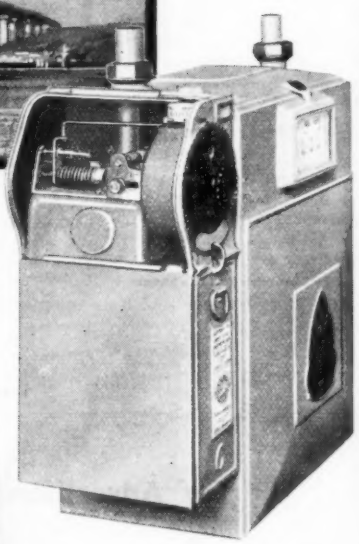
General Gas Appliances Ltd.
Audenshaw, Manchester

TILED OR WILLOW PATTERN EXTERIOR ENAMELS

The Mark of Fine Craftsmanship.

STRENGTH, RIGIDITY and PRECISION

Three Sterling Qualities embodied in the building of THOMAS GLOVER METERS



Note the Simplicity of the Thomas Glover Mechanism.

THOMAS GLOVER & CO., LTD.

ORIGINAL DRY GAS METER MAKERS ESTABLISHED 1844

GOTHIC WORKS : EDMONTON : LONDON N 18 : & BRANCHES

PARKINSON'S STATION GOVERNORS

Can be Pressure-Loaded from a distance.
Every P.L. Governor carries a "Gasways Indicator" showing the degree of opening.

ADVANTAGES OF PRESSURE LOADING

No more weight lifting.
Governor completely enclosed and leakage proof.
Unlimited pressures.

W. PARKINSON & CO.

INCORPORATED IN PARKINSON & COWAN (GAS METERS) LTD.

TERMINAL HOUSE, LONDON S.W.1.

Cottage Lane, City Road, LONDON.
Iron Lane, Stechford, BIRMINGHAM.
Raphael St., Cromac St., BELFAST.

THE GAS JOURNAL

SEPTEMBER 13, 1933

Vol. 203. 85th Year No. 3669

A Glance at the Contents—

Shipping, Engineering, and Machinery Exhibition.

A description is given of some of the plant and appliances at the Shipping, Engineering, and Machinery Exhibition at Olympia which are of interest to the Gas Industry. [p. 575.]

New Holder at Banbury.

Coincident with the centenary of the Banbury Gas Company, a new holder, erected by Messrs. C. & W. Walker, Ltd., was officially brought into operation on Monday last. [p. 559.]

Public Lighting of Margate.

Mr. H. V. Emptage, Lighting Superintendent at Margate, gives an account of the excellent lighting of this popular seaside resort. At present there are 1799 gas lamps and 34 electric lamps. [p. 573.]

Waterless Holder Inaugurated at St. Helens.

A waterless gasholder of 2 million c.ft. capacity, which forms part of the large extensions being carried out at the St. Helens Corporation Gas-Works, was brought into use on Wednesday last when the gas was turned on to the town's mains by the Chairman of the Gas Committee. [p. 561.]

Gas for Motor Vehicles.

In a letter to *The Times* last Saturday, Sir Samuel Instone urged the Government to take immediate action in regard to the use of gas for motor vehicles, and suggested that on and after an appointed day all omnibuses, charabancs, and commercial lorries over a certain horse-power should be compelled to use coal gas as their means of propulsion. [p. 558.]

William Young Memorial Lecture.

The Lecture given by Dr. F. S. Sinnatt, Director of Fuel Research, will stand among the important contributions to the year's technical literature. [p. 565.]

Association of Public Lighting Engineers.

The Tenth Annual Meeting and Conference of the Association of Public Lighting Engineers was held at Margate from Sept. 4-7, under the Presidency of Mr. E. M. Severn, of the South Metropolitan Gas Company. [p. 571.]

Engineer and Manager Wanted in Lancashire.

Applications are invited for the appointment of Gas Engineer and Manager to the Borough of Heywood Gas Department at a salary of £400 subject to a temporary economy deduction now in force. [p. 584.]

North British Association.

The Seventy-Second Annual General Meeting of the North British Association of Gas Managers was held in the George A. Clark Town Hall, Paisley, on Thursday, Sept. 7, under the Presidency of Mr. A. S. Nisbet, of Paisley. [p. 562.]

Unemployment Grants.

The case of *Birmingham Corporation v. Barnes* is likely to affect gas undertakings. The acceptance by the Board of Inland Revenue of the theory that the wear and tear allowance is to be based on the gross expenditure on machinery and plant, before deduction of any sum received in aid thereof, should prove of assistance to readers who have sought to obtain the maximum allowance. [p. 555.]

Forthcoming Engagements

Sept. 15.—GAS COMPANIES PROTECTION ASSOCIATION.—Meeting of Committee, 5, Victoria Street, S.W. 1, 2.30 p.m.

Sept. 21.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Meeting at Porthcawl.

Sept. 22.—I.G.E.—Meetings of Liquor Effluents and Ammonia Sub-Committee, 10.30 a.m.; Joint Research Committee, 2.45 p.m., 28, Grosvenor Gardens, S.W. 1.

Sept. 25-27.—B.C.G.A.—Annual Conference at Bournemouth.

Sept. 29.—I.G.E.—Meeting of General Research Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Oct. 12.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, S.W. 1, 2.30 p.m. Subject for discussion: "Coal Blending."

Oct. 17.—I.G.E.—Meetings of Board of Examiners, 2.30 p.m.; Publications Committee, 3 p.m.; Education Executive Committee, 4 p.m., 28, Grosvenor Gardens, S.W. 1.

Nov. 6.—I.G.E.—Meetings of Finance Sub-Committee, 2 p.m.; Membership Sub-Committee, 2 p.m.; General Purposes Committee, 3 p.m.; Council, 4.15 p.m., 28, Grosvenor Gardens, S.W. 1.

Nov. 7-8.—I.G.E.—Autumn Research Meeting, Institution of Mechanical Engineers.

Nov. 9.—S.B.G.I.—Autumn General Meeting, Hotel Metropole, London.

Nov. 14.—I.G.E.—Session at the Public Works, Roads, and Transport Congress and Exhibition, Royal Agricultural Hall, 11 a.m.; Joint Session of the Institution and the Association of Public Lighting Engineers, 3 p.m.

Nov. 14.—I.G.E.—Meeting of Gas Education Committee, 5 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 11.—I.G.E.—Meetings of Finance Sub-Committee, 2 p.m.; Membership Sub-Committee, 2 p.m.; General Purposes Committee, 3 p.m.; Benevolent Fund Committee of Management, 4.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 12.—I.G.E.—Meetings of Council, 10 a.m.; Gas Education Executive Committee, 4 p.m., 28, Grosvenor Gardens, S.W. 1.

Dec. 21.—I.G.E.—Meeting of Refractory Materials Joint Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

EDITORIAL NOTES

On the Way

WE are able to report from Greenock that the Gas Engineers who are on a visit to Canada and the United States have begun their journey under the most promising auspices, and that the party of sixty are keenly anticipating the warm welcome which they know awaits them on their arrival at the other side of the Atlantic. It is in every way a memorable occasion, seeing that it will be the first time in the history of the British Gas Industry for an official visit of this kind to be made to the Canadian and American Gas Industry. Two years ago, Mr. J. H. Canning, when President of the Institution, was present at both the Canadian and American Gas Association Conventions, and now Mr. F. P. Tarratt, during his year of office, is making this visit, accompanied by a Vice-President, Col. W. M. Carr, and a body of influential members of the Institution and the Industry. On the last occasion, it will be recalled, Sir Francis Goodenough was also at the American Convention, with Mr. Canning.

Having said that the present tour, which is to embrace many important visits, from both the professional and the sight-seeing points of view, has begun so auspiciously, it should be added that it has been initiated and organized by the Secretary of the Institution, Mr. J. R. W. Alexander, in collaboration with the American Gas Association and the Canadian Gas Association.

Pleasure Lighting

ESPECIALLY must a seaside resort provide attractive lighting; and that good gas lighting gives pleasure is amply proved by the illumination of Margate—one of the most popular seaside resorts in the British Isles. The Margate Council appreciate what an asset good lighting is, and they appreciate also how well gas lighting satisfies modern demands at low cost. In Margate to-day there are 1799 gas lamps—up-to-date gas lamps—and 34 electric lamps. The candle-power of the gas lamps is round about 500,000, representing an increase of over three times since the termination of the war. At the same time the lighting-rate has diminished, naturally to the satisfaction of the ratepayers, who are now called upon to pay 5·91d. in the pound instead of 8½d. previously. Incidentally, the gas and electricity supplies at Margate are privately owned.

Margate's public lighting was dealt with at the Conference by Mr. H. V. E. Emptage, the town's Lighting Superintendent, who described how the transformation in the lighting service has been effected since the war. It is a highly creditable record which shows how alert the Town Council have been to take advantage of new developments, such as automatic control, which has led to a reduction in mantle usage and has contributed to the efficiency of the general lighting and the greater cleanliness of lamps, and directional reflectors, which system has proved most satisfactory. The paper by Mr. Emptage is a fitting corollary to the account of Mr. J. M. Campbell, Engineer and General Manager to the Isle of Thanet Gas Light and Coke Company, given at the Edinburgh Session of the International Illumination Congress in September of 1931, who said that the town authorities have at all times looked upon the lighting of Margate's Front as one of the important factors in the steady increase in its popularity and prosperity. A wise policy indeed.

William Young Memorial Lecture

THE Gas Industry has grown accustomed to expect the William Young Memorial Lecture to be an outstanding event among technical meetings. By asking the Director of Fuel Research to deliver the lecture this year, the North British Association of Gas Managers made a wise selection. Dr. F. S. Sinnatt's contribution (which appears in this issue) will stand among the most important contributions to the year's technical literature. The subject is " Young, Beilby, and Some Experiments on the Carbonization of Coal." It would be difficult to find a subject more after the heart of the man in honour of whose name the lecture is given. Above all things William Young was an experimentalist. As Dr. Sinnatt points out, his name was associated with about 137 original papers and patents, and his mark was made on many branches of fuel treatment. For many years he was associated with Sir George Beilby in the development of a number of fuel patents. Thus Young was a co-worker with the first Director of Fuel Research, and the Fuel Research Station in its equipment and organization has gained from its contact with the leaders of the Scottish Shale Industry.

Dr. Sinnatt indicates that the present programme of work at the Fuel Research Station is the natural development of the programme formulated by Sir George Beilby at the inception, and he emphasizes that the underlying principle of the Station is to enable the subject of the treatment of coal to be investigated on such a scale that the results can be applied directly by industry without further development, thus saving much development research.

In his William Young Memorial Lecture Dr. Sinnatt describes certain of the more recent experiments upon the carbonization of coal carried out at the Fuel Research Station. The first subject dealt with is the recent work on the production of easily ignitable smokeless fuel in narrow brick retorts. The Fuel Research Board, from its inception, has felt the need for an efficient substitute for raw coal. The consumer cannot be expected to maintain stocks of different solid fuels for different purposes, and hence the need for an " all purposes " coke. As Dr. Sinnatt puts it, " Up to the present coke made in gas-works or coke-ovens has not been found to suit all domestic requirements, although it is eminently suitable for certain purposes. Some of the objections to high-temperature coke for the open grate are overcome by installing special grates, but the cost of the installation falls, as a rule, on the consumer. The problem of domestic heating, as it exists to-day, will only be solved when ' all purposes ' coke is made suitable for every domestic requirement." This is an opinion of considerable importance. It is beyond question that a growing number of consumers are finding smokeless fuel produced by low-temperature carbonization processes a convenient substitute for coal on the open fire. If this movement grows and if we accept the proposition of an " all purpose "

coke, then the Gas Industry will have to consider seriously its attitude towards an improved coke.

Recent work at the Fuel Research Station, described by the Director, relates to carbonization in narrow firebrick vertical retorts working either continuously or intermittently. With a major axis of 6 ft. 6 in., a minor axis tapering from 7 in. at the top to 11 in. at the bottom, and a height of 21 ft., these retorts have been found to give a throughput of 5-10 tons per day according to the class of coal being carbonized. The method of heating is stated to be of great importance. The retorts are heated by horizontal flues, the whole of the fuel gas being introduced in the top flue. Air is introduced at subsequent horizontal flues. The top flue is maintained at a temperature of 900°-1170° C., according to the type of coal being carbonized. The throughput is so maintained that the inside face of the retort does not exceed 700° C. if a free-burning domestic fuel is to be obtained. When carbonizing below this temperature the formation of scurf in the brick retort is a very slow process. It is stated that the installation comprising two retorts has been in operation for over fifteen months, experimenting on a variety of coals, making coke in all cases " relatively free burning " while producing tar " not dissimilar in properties to that obtained when coal is carbonized at low temperatures." Experiments at the Station show that the ease with which the tars can be hydrogenated is materially influenced by the temperature on the inner face of the retort; generally speaking, the lower the temperature the more easily is the tar converted into spirit. In order to be able to heat the setting with rich gas made in the retorts—an eventuality which may arise in certain cases—a specially designed burner was made capable of burning the gas without deposition of soot. Further, the plant has been worked at temperatures of 1200°-1250° C. from top to bottom when the products produced are the same as those ordinarily obtained from high-temperature carbonization.

We agree with Dr. Sinnatt's view that this design of carbonizing plant merits close attention, as the method appears to be a flexible one and may be capable of producing a free-burning coke with a high yield of low-temperature tar, and by changing the temperature in the flues, high-temperature products can be obtained. In due course a little more information on technical results, such as grading of coke produced, shatter test of coke made, and capital and operating costs, will be welcome, but in the meantime the Fuel Research Board seem to have developed a type of low-temperature carbonization plant which should give reasonable maintenance costs.

Research on Horizontal Retorts

THE second section of Dr. Sinnatt's paper relates to work carried out at the Fuel Research Station at the suggestion of Mr. Madden, of Cardiff, on the steaming of horizontal retorts. Employing normal horizontal retorts with 12-cwt. charges, it has been found possible to introduce steam over the last three hours without marked influence on combustion chamber temperature. The result of this has been to raise the yield of gas from 75 therms per ton to 87 therms per ton. When the throughput of the setting was increased from 10 tons to 11 tons per day, steam could only be introduced during the last hour. The experiments have shown that there is little to be gained by adopting special methods of charging, provided the retorts are fairly full of coal.

The first results published on this fascinating possibility in connection with horizontal retorts certainly merit the attention of engineers. When working the setting on 12-hour charges with a throughput of 10 tons per day the therms per ton were 75·1, as already indicated. Keeping the daily throughput and fuel consumptions constant, by steaming for the last 2, 3, and 4 hours, the therms per ton were 84·6, 86·9, and 86·8 respectively, while the calorific values were 520, 512, and 475 B.Th.U. per c.ft. The last test was beyond the heat capacity of the setting, resulting in a temperature fall. We quote the above figures merely to indicate the significance of this work on horizontals.

We hope that at some future date we may be able to publish a paper dealing specially with this subject of steaming in horizontal retorts when the work has progressed further. Dr. Sinnatt states that one gas-works has carried out some experiments recently in steaming retorts, and the first trials appear to be fairly successful. A considerable number of questions still remain unanswered, and work is in progress at the Fuel Research Station.

The third subject dealt with by Dr. Sinnatt relates to the experimental work at the Fuel Research Station on increasing throughputs of horizontal retorts by increasing the volume of the heating gases being circulated round the retorts. In the first experiments in a five-year old setting the throughput was raised from 10 to 17 tons per day. As the retorts were nearing the end of their useful life, it was decided to reconstruct them and also to modify the setting to the extent of raising the bottom tier of retorts 1 ft.—these being the retorts which normally were the slowest to carbonize—and of supplying air at the top of the setting. With this new setting more powerful fans were installed to increase the volume of heating gases circulated. The new setting, however, has not shown the same capacity for throughput, the maximum being 16·2 tons per setting per day—this in spite of the fact that the average surface temperatures of the retorts are higher in the new setting than the old. It is important to note that the fuel consumption during this peak output amounted to 20%, and the therms per ton were about 4% below normal. In his concluding paragraphs Dr. Sinnatt indicates that the future programme of work on the horizontal retorts includes experiments in which steam will be added to the charge, heating of the retorts at the same time being modified by increasing the volume of the heating gases. In his view this technique provides a method by which the throughputs of horizontal settings may be increased to meet any special demands for an increased production of gas.

These comments are intended merely as an incentive to our readers to make a careful study of this provocative and informative lecture. The Director of Fuel Research has given a glimpse of the important work at present going on at the East Greenwich Station, which may have far-reaching effects on the methods of gas and coke manufacture.

Unemployment Grants

ALMOST simultaneously with the publication of the Final Report of the Unemployment Grants Committee (of which a brief commentary appeared in these columns on Aug. 9), the High Court delivered judgment in a case in which the Corporation of Birmingham successfully appealed against the ruling of the Revenue Authorities on a further point of income-tax law. This arose out of the Treasury Grant authorized by the Committee in 1921.

The House of Lords decision in *Seaham Harbour Dock Company v. Crook* (1931; 16 T.C. 333), that the receipt of unemployment grants does not attract income-tax liability, has already been reported in the " JOURNAL." The present case of *Birmingham Corporation v. Barnes* (1933; King's Bench Divisional Court), if of less general application at the moment, will undoubtedly affect many gas undertakings at a later date, and the acceptance by the Board of Inland Revenue of the theory that the wear and tear allowance is to be based on the gross expenditure on machinery and plant, before deduction of any sum received in aid thereof, should prove of assistance to readers who have sought to obtain the maximum allowance. The Birmingham Corporation received from the Unemployment Grants Committee a sum of £46,238, representing nearly one-sixth of the outlay upon the renewal in 1921-22 of the municipal tramway tracks. Under a special arrangement with Somerset House—somewhat similar to the principle of the form of agreement available to gas companies—tramway undertakings are entitled to an annual wear and tear allowance calculated at the rate of 8% of the " sum actually expended " on renewal of tracks, in order to provide for the writing-off of the expenditure over the estimated life (12 years) of tramway tracks.

Although a decision of the Special Commissioners is

not legally binding on either the Revenue or the taxpayer (except in so far as they are parties to the particular appeal), the Authorities had followed a ruling of the Commissioners, given in October, 1926, in the case of another local authority, and agreed to this allowance being based on the full cost, notwithstanding that part of the expenditure had been defrayed from a State Grant. The Commissioners arrived at their decision, and the Revenue did not dispute it in the Birmingham case, because sub-section (6) of Rule 6 to Cases I. and II. of Schedule D would later be brought into operation, when any over-allowance could be adjusted by forcing the Corporation to appeal to the Courts for an interpretation of the Rule.

Sub-section (6) has the effect of limiting the aggregate annual wear and tear allowances to the actual cost of the machinery and plant to the person making the claim for the allowance. This limitation was imposed in 1907, and was the main support for the contention of the Inland Revenue to disallow that part of the current allowances which would have the effect of exceeding in the aggregate the net cost to the Corporation of the renewals of track. After consideration of the arguments adduced by counsel on both sides, Mr. Justice Finlay allowed the appeal, and gave his ruling that the Commissioners were erroneous in point of law in upholding the Revenue view, and that the "actual cost" to the appellant Corporation was unaffected by the receipt of a grant from the Unemployment Grants Committee towards the cost of the work in question.

This judicial ruling should help the many gas undertakings who took advantage of the Government's scheme to promote the increase of employment, and who would otherwise be penalized by the former attitude of the Taxing Authorities. While the re-opening of past assessments which have become "final and conclusive" is—save in special circumstances—not possible, there must be a number of cases in which the amount on which wear and tear allowances (on, say, a gasholder or other plant or machinery erected or acquired and installed under the terms of the Grants Committee) is still in dispute. Apart from these cases, however, the point is bound to arise when the machinery or plant is replaced and it becomes necessary to compute the allowance to be granted, for income-tax purposes, for "obsolescence." The Birmingham decision—subject to an appeal to a higher tribunal by the Board of Inland Revenue—definitely sanctions an allowance based on the total expenditure in question, regardless of the financial assistance received from outside sources.

Incidentally, it may be added that the judgment of Finlay, J., in this case also covered the circumstances where the Corporation received from the Dunlop Rubber Company, Ltd., a payment towards the cost of laying a tramway track to the Company's works, for the use of its workpeople. The actual cost to the Corporation (for the purpose of computing the aggregate wear and tear allowances) was likewise held to be the expenditure incurred before deducting the amount contributed towards that cost. While of less importance to the Gas Industry from a general point of view, it is probable that this part of the judgment might be applied with advantage in cases where a consumer contributes towards the cost of plant installed for his convenience, and on which the undertaking may be entitled to claim a deduction in respect of wear and tear.

PERSONAL

Sir FRANCIS GOODENOUGH, C.B.E., has joined the Directorate of British Industries House. The building in which British Industries House is being established was formerly known as Gamages (West End), Marble Arch, London, and is to be opened shortly as a permanent buying centre for British goods. The scheme is backed by six important London Insurance Companies.

* * *

The Joint Gas and Electricity Committee of the Loughborough Town Council are recommending the appointment of Mr. R. PRINCE, at present Gas Engineer to the Heywood (Lancashire) Borough Council, as Engineer and Manager of the Loughborough Corporation Gas Undertaking.

* * *

A presentation on behalf of the Directors, Officials, and Staff of Richmonds Gas Stove Company, Ltd., has recently been made to Mr. MAURICE H. THORNTON to mark the occasion of his forthcoming marriage. The presentation took the form of a handsome bureau and bookcase and a silver tray. Mr. Maurice Thornton is the son of Mr. H. M. Thornton, the Chairman of the Company.

* * *

To mark his marriage, Mr. J. M. DOW, Technical Assistant at the Kirkcaldy Gas-Works, received a presentation last week from the staff.

* * *

Mr. ALEX D. KING, Gas Manager at Bo'ness, is to be married, and last week the Directors and Officials of the Company, presented him with a mahogany bureau and a silver toast rack, while a china sandwich set was presented to him by the workmen.

* * *

The marriage took place last week, at Toft Church, of Mr. RONALD PRINSEP LANGFORD-BROOKE, elder son of the late W. P. Langford-Brooke and Mrs. Langford-Brooke, of Mere Hall, and Miss HELEN DEMPSTER, younger daughter of Mr. and Mrs. Charles Dempster, of Colshaw Hall, Knutsford.

* * *

Between the sessions of the 72nd Annual Meeting of the North British Association in Paisley last Thursday, the President, Mr. A. S. NISBET, Engineer and Manager to the Corporation Gas Department, entertained at luncheon his Convener, Members of the Gas Committee, other Officers of the Corporation, the President-Elect of the Association, and numerous other friends. Col. Kenneth Barge (of Messrs. Richard Smith, Ltd., Glasgow) and Mr. Nisbet, proposing and replying to the toast of the day, fully maintained the delightful informal atmosphere of the function.

OBITUARY

The death has occurred at Melton Mowbray of Mr. GEORGE ROSE, until recently Secretary of the Melton Mowbray Gas and Coke Company, Ltd., an office he had occupied for 52 years. Mr. Rose was 77 years of age.

THE NEWS OF THE WEEK

An Exhibition of Gas Appliances was held by the Carluke Gas Company, Ltd., in the local Town Hall last week.

The Taunton Gas Light and Coke Company were awarded first prize in the class for the best trade display at Taunton Carnival on Saturday, Sept. 2.

The Price of Gas in Renton (Dumbartonshire) is to be reduced from November. Ordinary consumers will now pay 3s. 9d. per 1000 c.ft., while the rate for slot meters will be 4s. 2d. per 1000 c.ft.

The Birkenhead Corporation propose to borrow £55,000 for gas undertaking purposes. At the Ministry of Health Inquiry held in the town a few days ago, Councillor A. E. Farlow, Chairman of the Gas Committee, said that the Committee was responsible for an area of 35 sq. miles. The geographical position of Birkenhead was such that they had a demand for export coke, but they had difficulty in selling coke made on horizontal plant. This had not been satisfactory for a number of years.

A Proud Record is that of the firm of Messrs. Sidney Flavel & Co., Ltd., of Leamington, whose capital, as noted on another page of to-day's "JOURNAL," has been increased by an addition of £32,000. Founded by John Flavel about the year 1777, the history of the firm has been one of continued progress, the same care and attention being given to the production of the earliest types of kitcheners on the manufacture of which Messrs. Flavel commenced business as to the up-to-date and efficient equipment which is produced at the present time, including many coke and gas units and the well-known "Metro" coke fire.

A Decorated Lorry entered by the Ferndale Gas Company, Ltd., in a local Carnival won first prize.

The Kirkconnel Gas Company, Ltd., has reduced the price of gas from 7s. 6d. to 7s. 1d. per 1000 c.ft.

The Last Instalment of the principal loan for the purchase of the Ilkley Gas-Works has been paid. The loan was sanctioned in 1893 for a period of 40 years, amounting to £56,286. During the 40 years some £36,000 has been contributed by the Undertaking to relief of rates. The only loans now outstanding amount to £6500, of which £3500 is in respect of the supply to Addingham.

Falling Leaves, Falling Temperature, is the title of an attractively coloured leaflet which is being sent out to 70,000 quarterly consumers of the Newcastle-upon-Tyne and Gateshead Gas Company to launch the gas fire campaign for the coming winter season. Chilly mornings, chilly evenings—times when a gas fire is a perfect boon—is the appeal which is made to consumers in Newcastle and district.

After Prolonged Negotiations on the question of price, the Bradford Corporation Gas Committee recommend the sale of the Wilsden Gas-Works to the Bingley Urban District Council for £22,500. Wilsden has for a good many years past been a part of Bingley, and there is a desire both in that district and in Bingley that the gas supply there be brought into line with that of the remaining parts of Bingley. The Bingley Council had the option to compel Bradford to sell, and the negotiations were entirely a matter of price.

For Canada and the U.S.A.

THE INSTITUTION OF GAS ENGINEERS' PARTY PHOTOGRAPHED ON BOARD THE "DUCHESS OF YORK" AT LIVERPOOL, PRIOR TO SAILING FOR CANADA.

THE NEWS—*continued.*

After Considering the Question of installing gas and/or electricity in the dwellings on the new Stockdale Gardens housing scheme, the Housing Committee of the Deal Town Council resolved that gas lighting and heating be provided, and slot meters fixed, this method being considered the more practicable.

Wales and Monmouthshire Association.

The Autumn Meeting of the Wales and Monmouthshire Association of Gas Engineers and Managers, to be held at Porthcawl on Sept. 21, coincides with the official opening of the new vertical retort installation at the Porthcawl Gas-Works.

By kind invitation of the Chairman and members of the Porthcawl Urban District Council, members of the Association will inspect the plant, the contract for which was signed and sealed on the day when the Association met in the town last year.

The items on the agenda of the half-yearly meeting include the introduction of the President-Elect, Mr. W. Collin; presentation of a salver to the retiring President, Mr. I. G. Jenkins; presentation of certificates and prizes and a paper by Mr. D. A. Pratt, of York, on "What is Wrong with the Gas Industry?"

S.B.G.I. Prize Winners.

Below is a list of the winners of the prizes given by the Society of British Gas Industries in the City and Guilds of London Institute's Examination in Gas-Works Practice, Gas Supply Practice, and Gas Fitting:

MINOR COURSE IN GAS-WORKS PRACTICE.

1st Prize.	£5 5s.	Thomas Pearson Napier.	Examined at Kirkcaldy.
2nd Prize.	£2 2s.	Edwin James Sanderson.	Examined at Southend-on-Sea.

MINOR COURSE IN GAS SUPPLY PRACTICE.

1st Prize.	£5 5s.	Cyril Charles Holwell.	Examined at Westminster Technical Institute.
2nd Prize.	£2 2s.	Stanley Louis Meadows.	Examined at East Ham.

FINAL EXAMINATION IN GAS FITTING.

1st Prize.	£5 5s.	Alfred Leonard Witt.	Examined at Westminster Technical Institute.
2nd Prize.	£2 2s.	John Sykes.	Examined at Leeds.

Gas for Propulsion of Motor Vehicles.

Immediate Action Urged.

Writing to *The Times* of last Saturday, Sir Samuel Instone said:

A great deal has been said and written recently on the question of hydrogenation of coal and the part it will play in reviving the coal-mining industry.

Sufficient has been said by those qualified to express an opinion to show that while the process of hydrogenation may provide in quite an ordinary commercial manner an outlet for a comparatively very small quantity of coal, and provide an infinitesimal quantity of oil and petrol, to talk about the process of hydrogenation, as known to-day, as being the solution of our loss of trade and unemployment in the coalfields is so ridiculous that it makes one wonder what has become of the sense of proportion in certain directions.

There is a future for coal, and a very great future for bituminous coals, but in quite another direction. It is a future that will not only save enormous sums to the country, and provide a large outlet for coal, but in addition will prove a boon to the steel trade. I refer to the use of coal gas for the propulsion of motor-vehicles. Birmingham has in the past played a great part in the industrial welfare of this country, and the country is indebted to the mining research laboratory at the Birmingham University for having proved to us that motor-vehicles can be run on coal gas at less cost than on petrol.

Hitherto a great difficulty has been the storage of the gas, but experiments have provided us with alloy steel cylinders of sufficient strength and lightness in weight, which have overcome this problem.

I do not suggest that private cars should as yet use coal gas, but there is no reason why every omnibus, charabanc, and commercial lorry should not be run on coal gas alone. The cost of adaptation is trivial, and it will only remain for the gas undertakings all over the country to compress the gas into tubes and organize the distribution. This can be done by stocking the principal filling stations on the roadside with gas-charged cylinders, or by the gas undertakings erecting a chain of charging stations on all main roads.

The Government sponsored the Electricity Board in raising the money for the erection of the electricity "grid." There is no reason why they should not do the same for a gas "grid."

GREATER POWER—BETTER ACCELERATION.

It is claimed that the thermal efficiency is considerably greater with gas than with petrol, and that the exhaust gases contain no appreciable quantity of carbon monoxide. Recent experience of the Birmingham Corporation Laboratory has been that a greater maximum power can be obtained from gas than from petrol, with better acceleration. Under average public service conditions the gas consumption of the omnibus appears to be about 50 c.ft. per mile run, giving the vehicle a range of approximately 50 miles before a fresh charge of gas is required.

It is interesting to see the results obtained by the mining research laboratory of the Birmingham University, who say:

"It is clear from what has already been said in regard to the cost of gas utilization that the cost of compression forms the greatest charge. This charge is the same for gas of high calorific value as for low, and obviously the greater the number of therms in the gas the less the cost of compression per therm. Pure methane has a gross calorific value, measured at 30 in. pressure and 60° F. (saturated), of 995 B.Th.U., against the customary 450 or 475 B.Th.U. of coal gas or 500 to 525 B.Th.U. for coke oven gas. Gas from low-temperature carbonization may have a gross calorific value of nearly 900, and if available for compression would form an excellent gas for carrying in compressed form for use as a fuel for motor transport. With gas of such thermal value it is obvious that the mileage capable of being covered before re-charging of the cylinders is required will be almost double that where ordinary coal gas is used, and the cost of compression per therm approximately half. . . ."

The National Government were given practically dictatorial powers to bring about a revival of industry. Let them now use these powers by a bold policy. Were I head of the competent Government Department I would first of all satisfy myself that the Birmingham experiments have succeeded, and after having made adequate arrangements for the distribution of gas, either in cylinders or by charging stations, I would fix an appointed day on and after which all omnibuses, charabancs, and commercial lorries over a certain horse-power would be compelled to use coal gas as their means of propulsion.

This would inflict no hardship on anybody, and it would not only save the country millions of pounds per annum on the importation of oil and petrol, but it would bring prosperity to a large number of mines and the steel manufacturers; and while we have the resources in this country, and so many unemployed, it is inconceivable to think that such a source of wealth should be allowed to remain fallow.

This is a matter that requires no long-drawn-out conferences, but strong, firm, and immediate action.

Richmonds' Developments.

A close examination of Richmonds' new season's Gas Fire Book leaves one with a delightful impression of the many charming designs and finishes it contains. Carefully set out and clearly printed, the book is a record of achievement in modern gas fire design and construction. It will prove of great help to every gas salesman.

The new book gives a prominence to the "Marlborough" and "Charterhouse" fires which their popularity deserves. A special feature is also made of the "Beam" radiants, which have done so much to place Radiation gas fires in their present strong position.

Technical points which appeal to the technical man are to be found in the fact that component parts of Richmonds' fires—*i.e.*, burner, injector, back casting, firebrick, adjustable flue, radiants, radiant carrier, and radiant clip-all are interchangeable, size for size, throughout the whole series of Radiation standardized fires. The broad advantages of this system have been too frequently stated to need reiteration here, but it is always well to recall that they operate to the advantage of all concerned and reduce maintenance and storage problems.

A section of Richmonds' new book is printed in full colours and gives most pleasing and artistic reproductions of many beautiful "Lustre" and "Metal-Clad" finishes. These various "Lustre" colours (now increased to eight by the introduction of a new "Opal" finish) are destined to enjoy an ever-increasing demand. The "Metal-Clad" brass, copper, and pewter fires also enjoy popularity. All who are interested in the sale of gas will find Richmonds' new book a powerful ally in the conduct of their business.

BANBURY GAS COMPANY

Centenary Celebrations

Jackson's Oxford Journal of Sept. 14, 1833, records "That a general meeting of subscribers for promoting the establishing of a Joint Stock Company for lighting the town of Banbury with gas was held at the Town Hall on the 11th inst., when it was resolved that a Company should be formed and be called 'The Banbury Gas-Light and Coke Company.'" The Company's supply of gas commenced in March, 1834, as the following records from *Jackson's Oxford Journal* of March 13, 1834, shows: "The first illumination in honour of the Gas Company's first supply of gas will take place this evening (Thursday). 'W.R.' in large characters will be illuminated in front of the Town Hall and a splendid star in the Horse Fair where the roads cross. We do not expect the town will generally be illuminated, but that many of the shopkeepers will reserve their splendour to a future evening."

The same journal records the following week: "The illuminations took place, and in the Horse Fair a star of the first magnitude presented its rays towards the monument. Mr. Sharpe, of Northampton, highly entertained a very numerous concourse of spectators by his scientific mode of roasting a leg of mutton (the flavour of which was excellent) with gas. He also roasted a leg of pork with gas on Friday, which was equally good, on a table in the theatre, in his portable cooking apparatus, and his explanations elicited the encomiums of his auditors. His mode of heating rooms by a small quantity of gas on a construction of entirely his own invention deserves the highest praise."

The following records appear in the Directors' Minutes: Nov. 24, 1834—"Ordered that the men shall be allowed one shilling for beer for loading twenty quarters of coke, and sixpence for ten quarters." May 4, 1841—"Ordered that two workmen be allowed sixpence a day each while painting the gasholder." Jan. 14, 1845—"Directed that new lock be supplied to the door of the Committee Room, and that it be a good one." Jan. 27, 1846—"Directed that the chairman be requested to inquire into the expense of an ear trumpet for the lamp lighter."

Continued Development.

The first Company was incorporated under the provisions of the Acts relating to Joint Stock Companies with limited liability, and was styled "The Banbury Gas-Light and Coke Company, Ltd.," with a capital of £3500, which, by 1866, had increased to £10,000, with loan capital of £2500.

In 1866 the present Company obtained its first Act of Parliament (incorporating the former Company), for the purpose of making further provision for lighting Banbury and places in the neighbourhood thereof in the counties of Oxford and Northampton with gas. Extensive enlargement of the works was made, including a new single-lift gasholder, new purifiers, and other plant.

In 1901 the Company embarked upon a scheme of free installation of cookers and other apparatus. There is no doubt this was to the Company's advantage as gas consumption steadily increased. In 1902 the first incandescent burner was introduced into the public lamps in various parts of the town, and in 1908 the whole of the lamps were lighted and extinguished by clock controllers. The year 1909 appears to have been a time of stress and anxiety for the management for major extensions and repairs occupied the whole year. Four new purifiers were installed with the necessary connecting mains, four new beds of eight retorts were erected, also a sulphate of ammonia plant, and extensive alterations were made to the mains in the town.

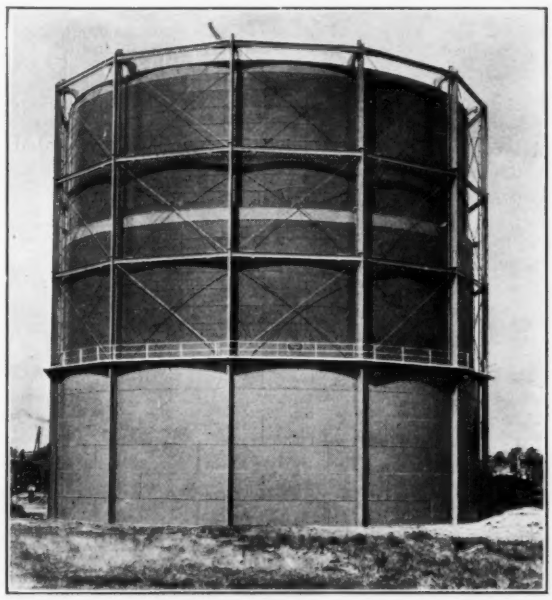
In 1910 a single-lift holder was demolished and replaced by a three-lift telescopic holder in the existing brick tank, and two years later a further extension in the retort house was made by the erection of a further three beds of eight retorts each.

After prolonged negotiations it was decided to supply gas in bulk to the Adderbury Works of the Counties Gas Company, and steel mains were laid from the Banbury Company's Works to that point and a connecting main taken to King's Sutton. A Waller boosting plant was installed at the works capable of developing a pressure up to 160 in., the necessary reduction being obtained at Adderbury and King's Sutton by Bryan-Donkin diaphragm governors.

In 1916 a shell filling factory was erected in the Causeway and demanded an extraordinary supply of gas. The Company's plant was worked to its full capacity, but the increasing load necessitated the immediate erection of a water gas plant, the contract for which was placed with Messrs. Humphreys & Glasgow, Ltd.

In 1922 gas mains were laid to the newly-developed Easington Estate. In 1931 another extensive system of new mains and replacements was embarked upon, a feeder main from the works through Turner's Field to Oxford Road being laid and continued along the same road, and mains to the Ruscote Estate in Warwick Road were also laid.

In December of 1932 the Company was successful in obtaining a contract with the Banbury Corporation for the lighting of the streets with gas for a period of three years. The year 1932 also saw the advent of the Northern Aluminium Company as potential consumers of gas. To relieve the congestion the engine room was enlarged—the positions of the whole plant being re-organized without cessation of supply. The stoking machine having been in commission for 23 years, the Directors decided to replace it by one of a modern type.



The New Holder at Banbury.

Increased Gas Storage.

The question of gas storage had been a serious problem for some time, and in order to maintain an uninterrupted and efficient supply of gas to the town and district a new gasholder became essential. The new 400,000 c.ft. guide-frame gasholder by Messrs. C. & W. Walker, Ltd., of Donnington, put into commission on Monday last, is the result of the Directors' decision to consolidate the position. The water gas plant has also recently been re-modelled.

The Present Works.

The present works are most conveniently situated between two lines of railways. The carbonizing plant consists of seven settings of eight through D retorts, operated by a Fiddes-Aldridge multiple stroke stoking machine installed in January, 1933, to replace the Fiddes-Aldridge machine which was installed in 1912. The machine is driven by electricity generated on the works.

The machinery and power house comprise the following plant: One 40,000 c.ft. per hour three-blade Bryan-Donkin exhauster automatically lubricated and driven by a Donkin horizontal steam engine at 70 lbs. pressure; one 30,000 c.ft per hour three-blade Bryan-Donkin exhauster driven by a horizontal steam engine; one 25,000 c.ft. per hour steam driven compressor for supplying gas to the Northern Aluminium Company's Works; one 8000 c.ft. per hour steam driven compressor for supplying gas to the Adder-

bury Works of the United District Gas Company and King's Sutton; and two K.W. electrical sets, one gas driven and one steam driven, for generating electricity for the stoking machine.

The washing plant consists of two Livesey washers, one Holmes rotary brush washer, and one tower scrubber, and a four column set of annular condensers. The purifiers are six in number. These are emptied at the bottom, and all connections are accessible below the purifiers. There is also a Humphreys & Glasgow carburetted water gas plant complete with oil storage tank and other accessories, the capacity of which is 400,000 c.ft. per day.

The steaming plant comprises two Cornish boilers each fitted with Wilton's patent forced draught furnaces, each boiler having a working pressure of 80 lbs. per sq. in. An additional boiler will shortly be installed with a working pressure of 120 lbs. per sq. in.

The station meter is of the rotary type, and is capable of passing 40,000 c.ft. per hour.

Growth of the Undertaking.

Some idea of the growth of the Company during the past fifty years may be gathered from the following:

	Coal Carbonized. Tons.		Gas Made. C.Ft.
1883	3714	..	37,038,000
1908	6116	..	65,508,000
1932	9970	..	131,618,000

and 10,430 galls. gas oil

The Opening Ceremony.

Mr. T. E. D. Garrett, Chairman of Directors, presided at the opening ceremony, and was supported by his co-Directors. Among those present were Mr. W. R. Day, the Company's Manager and Secretary, Mr. A. W. Smith, General Manager and Secretary of the City of Birmingham Gas Department, Mr. W. J. Smith, Secretary of the National Gas Council, Mr. R. J. Milbourne, Managing Director of Messrs. C. & W. Walker, of Donnington, and Mr. W. G. Elson, of the British Commercial Gas Association.

Mr. W. R. Day explained that the new gasholder was of very sound construction and was well built, and Messrs. C. & W. Walker, Ltd., were to be congratulated on their workmanship. He had great pleasure in asking Mr. Milbourne officially to hand over the new holder to the Company.

Mr. Milbourne, in doing so, said the holder possessed one or two novel features, and he was sure the holder would give them good and lasting service. He congratulated the Company on being in a position to require such an increase in their plant.

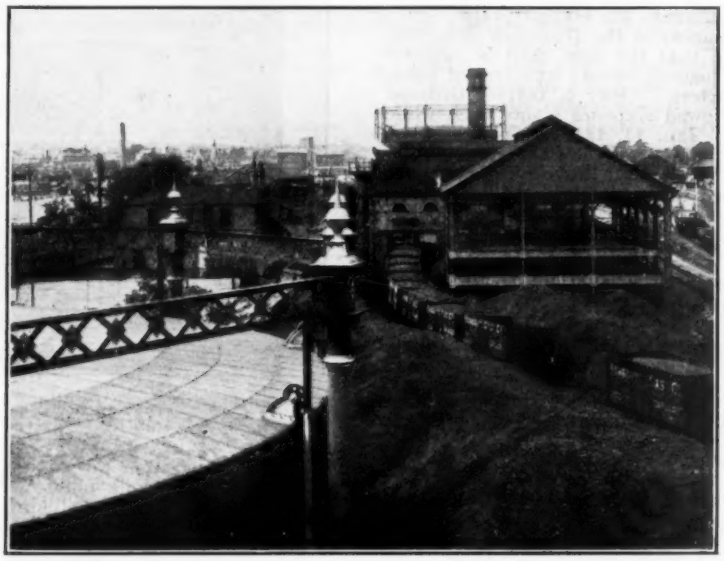
Mr. Garrett said he had great pleasure in receiving the holder from the contractors. They were celebrating the centenary of the Banbury Gas Company, and the ceremony in which they were engaged was not really a part of that celebration, but it was a happy coincidence that the inauguration of the new gasholder and the centenary celebration should fall at the same time. On behalf of the Directors he would like to testify to the excellent way in which the work had been done by Messrs. Walker and Messrs. Vale, and also to the supervision of Mr. W. R. Day. The spending of so large a sum of money on the new holder and on other work was evidence of the faith which the Directors had in the future of the Gas Industry and in the future prosperity and demands of the town of Banbury. He wished to express the thanks of the Board of Directors to the Mayor and members of the Town Council and other ladies and gentlemen for their kindness and expression of goodwill as shown by their presence at that ceremony.

This concluded the proceedings at the gas-works, and the company then motored to the Town Hall for luncheon, and the opening of the gas exhibition which followed.

Luncheon in the Old Council Chamber.

The Directors entertained the company at luncheon, which was served in the old Council Chamber at the Town Hall. Mr. Garrett presided.

Mr. A. W. Smith, of Birmingham, proposed the toast of "The Banbury Gas-Light and Coke Company." He expressed his thanks for the privilege accorded him, and referred to the tremendous revolution that gas had caused in the homes and lives of the people. He congratulated the Banbury Company on attaining their hundredth birthday. They were, if he might say so, a hundred years young, just as their Chairman was over eighty years young, and was as active and as keen as ever. It was remarkable that wherever they had an animated and prosperous gas company they generally had an enlightened and prosperous community. The Gas Industry was spread over very many units. The supply of gas to many millions of the population was in the hands of 1300 gas undertakings. Wherever they found an antiquated and ill-managed gas company they would also find an antiquated and very conservative community. He thought that in Banbury they had an enlightened and progressive Gas Company as well as an enlightened community.



GENERAL VIEW OF BANBURY GAS-WORKS FROM TOP OF NEW HOLDER.

Mr. Garrett said it was a great pleasure to the Directors to meet the Mayor, Aldermen, and Councillors of the town and other friends in that way to celebrate the hundredth birthday of their Company. The proposer of the toast had brought to their notice the progress of the Gas Industry during the past hundred years. They, as a Company, had shared in that progress in the early part of that hundred years in the lighting of the homes and streets and in cooking, and later in the warming of buildings and dwelling-houses by using gas fires and in various other ways. Since their present Manager, Mr. W. R. Day, had held that office a number of improvements had been carried out. It was the present policy of the Directors—and he felt sure it would also be the future policy—to endeavour to do all in their power to meet the requirements of the town. The erection of the new gasholder was another step in what they hoped would be a continuous programme of serving the public.

Presentation to the Chairman.

Mr. E. Ryman Day (Vice-Chairman of the Company) asked Mr. Garrett to accept a bound copy of the brochure of the proceedings with the best wishes for the future of the Company. They hoped he would continue to be Chairman for many years.

Mr. GARRETT said he would value the present for the rest of his life and would hand it over to his son.

Mr. RYMAN DAY then proposed the toast of "Our Guests," and coupled with it the names of Mr. W. J. Smith, of the National Gas Council, Mr. R. D. Palmer, and the Mayor, and the toast was cordially received.

Mr. W. J. SMITH responded to the toast, and wished the Banbury Company every happiness and prosperity in the future.

Mr. R. D. PALMER, of the Northern Aluminium Company, Ltd., also replied.

The MAYOR said that on behalf of the Town Council and himself he would like to thank the Company most sincerely for their kind invitation. They acknowledged the good work which the Gas Company were trying to do to help the trade of the town. The Town Council was very interested in the Gas Company, and he appealed to them all to support the exhibition in the large hall.

OPENING OF THE EXHIBITION.

The company then adjourned from the old Council Chamber to the large hall for the opening of the Exhibition. Mr. Garrett presided, and was supported by the Mayor and Directors of the Gas Company.

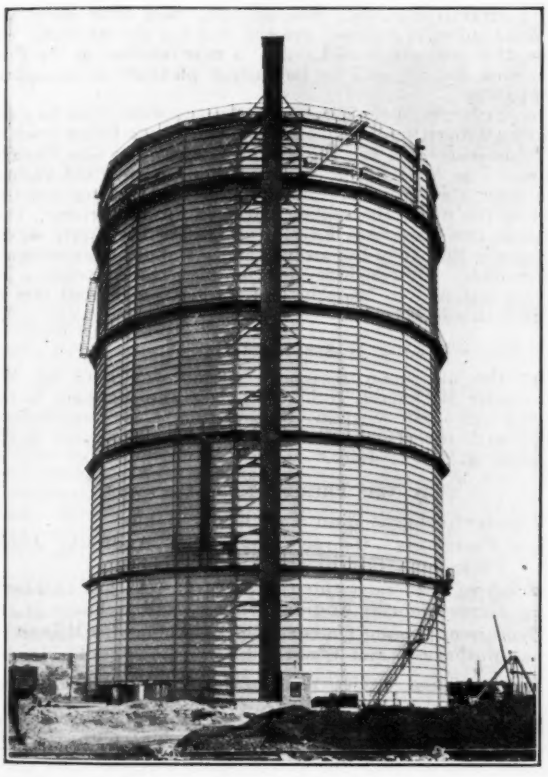
The Mayor formally declared the Exhibition open, and the ceremony was followed by cookery demonstrations by expert cooks, the greatest interest being taken in the instructive addresses and in the various appliances displayed.

Waterless Gasholder Inaugurated at St. Helens

General Works Extensions

A waterless gasholder of 2 million c.ft. capacity, which forms part of the large extensions being carried out at the St. Helens Corporation Gas-Works, was brought into use on Wednesday last when the gas was turned on to the town's mains by Alderman Sir James Crooks, Chairman of the Gas Committee.

St. Helens Corporation took the gas-works over in 1875 from the Gas Company which started the public supply of gas in the town 101 years ago. During the past ten years the make of gas has increased from 555 million c.ft. to 943 millions, and for some time past the work of doubling the size of the gas-works has been in hand. About £100,000 is being spent.



The New Waterless Holder at St. Helens.

The new holder brings the storage capacity up to 5 million c.ft., and in addition to the holder new stores, repair shops, exhaust house, condensers, purifiers and washing plant, as well as a benzole extraction and rectification plant, have been added. In 1907 continuous vertical retorts were first used at St. Helens, Mr. Samuel Glover, who was Manager for many years, being the inventor. In 1921 Mr. F. E. Ward succeeded the late Mr. Glover, and since 1922 the whole of the carbonizing plant has consisted of continuous vertical retorts.

Among those present at the inauguration on Wednesday were the Mayor of St. Helens, Mr. T. Wood, and Mr. F. J. Siddall, of Messrs. R. & J. Dempster, Ltd., of Manchester, the contractors for the holder.

The members of the Committee ascended the holder by means of the electric lift and were thus enabled to inspect the structure inside and out.

Councillor O. MAGUIRE, Deputy-Chairman, on behalf of the Committee, asked Sir James Crooks to complete the work of erecting the holder by turning the gas into the mains. The Committee were delighted that Sir James was able to be present that day. He had shown great interest and had led the Department carefully and shrewdly through the task of extending and developing the gas-works; and they all hoped he would be with them to see the whole of their projects successfully carried out.

Sir JAMES CROOKS said he was happy to be able to put the holder into service. He believed it would prove a great benefit. Before the Committee decided to adopt that type of holder they visited thirty or forty different towns.

Mr. F. J. SIDDALL, on behalf of Messrs. Dempster, congratulated the Gas Committee and their Engineer, Mr. Ward, upon the fine and up-to-date layout they had just completed. St. Helens would ever go down in gas history as one of the earliest works to adopt vertical retorts, and of the pioneer work carried out in that direction by the late Engineer, Mr. S. Glover, in conjunction with the late Mr. John West. A waterless holder, continued Mr. Siddall, was the only type of storage possible upon the site at command. All the piles, along with the under and outer surfaces of the concrete foundations, were covered with a special "Bowranite," in order to preserve them against attack from the chemical action of the site; yet, in spite of the additions found necessary, his firm were requested by the Committee to guarantee the foundation for a period of years, which condition they accepted. The holder was the first in the country to have roof lighting. The lights were easily removable, cleaned, and replaced, without any danger to the workman so employed. Concluding, Mr. Siddall, said that the St. Helens Corporation were to be congratulated on having had for such a lengthy period the services of Sir James Crooks as the Chairman of the Gas Committee. His help and advice must have been of great assistance to the late Engineer in his development of the carbonizing plant, and to Mr. Ward in the work they were celebrating that day. He (the speaker) had never met a gas engineer so painstaking as Mr. Ward.

Sir JAMES CROOKS eulogized the work of Mr. Ward and his staff, and said that no Corporation had a more efficient or hard-working Engineer than Mr. Ward. The St. Helens Gas Committee could pride themselves that out of profits they had given £112,750 to the relief of the Corporation rates, and in the matter of public lighting they had contributed £16,286, a total gift of £128,936.

THE PRINCIPAL CONTRACTORS.

R. S. ELLISON	Workshops, stores, garage, and cooker store
J. W. LEE	Tar and liquor well
CLAPHAM BROS., LTD.	Annular condensers
W. C. HOLMES & CO., LTD.	Water tube condensers and washing and tar extracting plant
ISAAC VOSE	Exhauster house
THE BRYAN DONKIN COMPANY, LTD.	Exhausting plant
NEWTON CHAMBERS & CO., LTD.	Purifiers and connections
TODD BROS.	Steelwork for roof over purifiers
WOLVERHAMPTON CORRUGATED IRON COMPANY, LTD.	Sheeting for roof over purifiers
R. & J. DEMPSTER, Ltd.	Holder and foundations, steel mains
EVANS LIFTS, LTD.	Electric lift to holder

North British Association of Gas Managers

ANNUAL MEETING IN PAISLEY

The Seventy-Second Annual General Meeting of the North British Association of Gas Managers was held in the George A. Clark Town Hall, Paisley, on Thursday, Sept. 7. The President, Mr. A. S. Nisbet, Engineer and Manager of the Paisley Corporation Gas Department, in extending a welcome to over 200 members, said that they were honoured in having present Provost James Galt, Baillie Mitchell, Convener of the Gas Committee, and other Town Councillors.

The PROVOST said that it was a great pleasure to him to welcome, as guests to Paisley, the North British Association, and was much gratified at the honour they had bestowed on the town and its very able Gas Manager, Mr. Nisbet. He considered that, in affairs of gas, Paisley could compare favourably with any other town in the country. Gas manufacture started in Paisley in 1823, and the concern was taken over by the Corporation in 1870. During that period of 110 years there had been only four Gas Managers, and he hoped their present Manager would not shorten the average length of service. He could claim Mr. Nisbet as a life-long friend, and could not speak too highly of his character, ability, and unshakable integrity. They had been told that electricity would oust gas, but it was now apparent that there was room for both, though it was essential that no new use for gas should lie unexamined. He hoped the visit would prove both profitable and enjoyable.

The President having expressed his gratitude to the Provost and thanked him for his interest in the Association, the Minutes of the two previous meetings, the seventy-first Annual General Meeting in Ayr on Sept. 8, 1932, and the Spring Meeting in Glasgow on April 7, 1933, were taken as read.

The SECRETARY, Mr. A. Kellock (Airdrie), then read apologies from members who were unable to be present. He had received a cablegram from Mr. J. W. M'Lusky (Glasgow), while among others who regretted their absence were Mr. F. P. Tarratt, the President, and Mr. J. R. W. Alexander, the Secretary, of the Institution of Gas Engineers, Mr. C. F. Botley, Hastings, and Mr. T. H. Poulson, the President of the Midland Association of Gas Managers.

THE ASSOCIATION'S REPRESENTATIVE IN CANADA AND U.S.A.

The PRESIDENT then extended, on behalf of himself and the Council of the Association, a welcome to all members attending. He was pleased to see so many present, and the pleasure was doubly dear to a man who doubted his ability to fill the chair, but he hoped the meeting would rank with those of the past. The Council had asked Mr. George Braidwood, Coatbridge, the President of the Waverley Association of Gas Managers, to represent the North British Association on the forthcoming tour of Canada and the United States; and he knew that this duty was in able hands and would be performed with dignity.

Mr. BRAIDWOOD said that he was highly honoured—while he might not represent the brains of the Association he would at least be able to represent them physically. [Laughter.] He hoped to gain a great deal of knowledge which he would impart to the Association on his return.

ANNUAL REPORT.

The Council's Annual Report had already been circulated among the members, and its adoption was moved by Mr. Lewis Bain, Cullen and Banff, and seconded by Mr. G. Bruce, St. Andrews.

NEW MEMBERS.

The following new members were then welcomed to the Association:

Mr. J. S. Ednie, Junr., Lesmahagow.
Mr. W. A. M. Stewart, Linlithgow.

PRESENTATION OF CERTIFICATES.

In presenting certificates to successful candidates in the recent examinations of the Institution of Gas Engineers, the President said that these young men, having made such a good beginning in the profession, would now have to study in the University of Life, and he wished them further success in the future. The following certificates were presented:

Higher Grade Gas Engineering (First-Class).—James Tracy, Tradeston Gas-Works, Glasgow.

Higher Grade Gas Engineering (Second-Class).—Thomas Russell Sawers, Denny; David Lambie, Coatbridge; Fredrick Robert Mitchell, Tayport.

WILLIAM YOUNG MEMORIAL LECTURE.

The PRESIDENT, in calling upon Dr. Sinnatt, Director of Fuel Research, to deliver the William Young Memorial Lecture, said that it had been indeed a happy thought to commemorate in this way the name of William Young. In Dr. Sinnatt they had a lecturer who would treat his subject well and bring before them points worthy of the closest consideration.

Dr. F. S. SINNATT, M.B.E., in rising to deliver his lecture, the text of which is reproduced on later pages, said that it was a profound thought that we should honour great men who had gone before, and in the Gas Industry there were no names more respected than those of Young and Beilby. He did not intend to read his paper, which had been so well printed by the "GAS JOURNAL," but would content himself by elaborating some of the more important points contained therein.

The Author then gave, in a delightfully easy style, a précis of the lecture, emphasizing leading points with lantern slides. At its conclusion,

The PRESIDENT said that Dr. Sinnatt had revealed to them a delightful personality. It was indeed a pleasant circumstance that a man of such high scientific ability should be possessed of such an easy form of utterance. The delivery of the lecture had been as enjoyable as the lecture itself, and he felt it a great honour to the North British Association that Dr. Sinnatt should have come to address them. He proposed a hearty vote of thanks.

Mr. DAVID FULTON, Helensburgh, said that they had heard a splendid lecture—erudite, but not dry-as-dust. Dr. Sinnatt's presence would create a new interest in the Fuel Research Board, and he had great pleasure in seconding the vote.

Dr. SINNATT, in replying, said that he would like to mention an important piece of work which was being done in collaboration with the Edinburgh Corporation Gas Department. The Fuel Research Board had circularized various concerns about the deterioration of coal during storage, and on the whole the replies had been unsatisfactory. One notable exception was Edinburgh, where they were so enthusiastic that they themselves had set about to investigate the matter. He concluded by thanking the Association for having listened so intently and for having invited him to deliver this lecture.

TRADE WASTE FROM GAS-WORKS.

At the afternoon session a paper was read by Mr. Alexander M'Donald, B.Sc., Engineer and Manager to the Motherwell and Wishaw Corporation Gas Department. This, with the report of the discussion, will appear in the "JOURNAL" next week.

THE NEW PRESIDENT AND OFFICERS.

President.—Lewis Bain, Cullen and Banff.

Vice-Presidents.—George Bruce, St. Andrews; James Dickson, Kirkintilloch.

Members of Council (for three years).—Arthur Cuthbert, Grangemouth; Andrew Walker, Kilbarchan.

Member of Council (for one year).—Alexander M'Donald, Motherwell and Wishaw.

The President having congratulated his successor, who, he said, would lend fresh lustre to the position,

Mr. LEWIS BAIN, as his first duty, thanked all for the honour that they had conferred upon him. It was the highest honour that the North British Association could pay any man, and he fully appreciated their confidence and would endeavour to uphold the high tradition of the Association. The place for the next meeting had not yet been fixed, but as he had been coming south for so long he would take the members north next year.

THE PRESIDENT'S BADGE.

Mr. T. W. HARPER, Ayr, as Immediate Past President, said that it was his pleasant duty to present Mr. Nisbet with the usual memento of office. [It takes the form of a small plaque, a replica of the Murdoch Memorial at Lugar.] Mr. Harper said that in introducing Mr. Nisbet at Ayr he had said that he would bring honour to the Association. Mr. Nisbet was a President who had raised the prestige of the Association very high.

Mr. Nisbet's acknowledgment was followed by an omnibus vote of thanks proposed by Mr. John Wilson, Dundee, to the Scrutineers, Authors, President, Council,

XUM

[*With acknowledgment to Mr. Cecil Poulson, of Glasgow.*

TO ARRAN WITH THE NORTH BRITISH ASSOCIATION.

Secretary, and to the Provost and Magistrates of Paisley for their hospitality.

The President's reply was supported by the Secretary.

Civic Reception.

In the evening some 320 members and friends were received by the Provost and Magistrates of Paisley in the George A. Clark Town Hall. A programme of dancing was arranged and there was whist for those who preferred the quiet of the card table to the rhythm of the dance floor. During an interval a short concert was given by local artists. The fine singing of Miss M. Campbell McDonald, and songs and stump speech by Mr. John Catterson, were greatly appreciated. Both artistes were ably accompanied by Mr. Robert Craig at the piano. The prizes for the Ladies' Golf were presented by Miss Nisbet, while the Provost's wife, Mrs. Galt, presented those for the whist. The President took the opportunity of expressing gratitude, on behalf of the Association and himself, to the Provost and Magistrates of Paisley for the wonderful hospitality which they had extended to them. The Provost, in reply, said that Paisley felt honoured in having had a visit from the North British Association. Dancing went with a swing until the early hours.

Excursion to Arran.

With a continuance of the glorious weather which was a feature of the meeting, a party of 200 set out from Glasgow on Friday morning for Wemyss Bay. Here they boarded the "Duchess of Argyll" and proceeded to Rothesay. The course then lay through the famous Kyles of Bute, past Tighnabruaich and down the coast of Arran to Corrie, Brodick, Lamlash, and Whiting Bay. Here the party went ashore for about an hour before returning *via* Garroch Head to Rothesay and Wemyss Bay. The sun shone brilliantly throughout the day, and the sail was an unqualified success.

Ladies' Visit.

In making arrangements for the meeting the Town Council of Paisley did not forget the lady visitors. A fleet of 'buses was put at their disposal on Thursday afternoon, and close on a hundred drove to Largs in beautiful weather. There they were entertained at tea at Curling Hall Hydro.

The Golf Circle.

The competition for the Association Challenge Bowl was played over the Killermont Course of the Glasgow Golf Club on Wednesday. Conditions were ideal, and 56 members competed. The trophy was won by Mr. H. A. Aitken, Leven, with the magnificent score of 73 − 8 = 65. This score also won the Scratch Prize; the follower-up being Mr. James Brock, with 74. The complete prize list was as follows:

HANDICAP PRIZES.

SECTION 1.

(Those with handicaps up to and including 15.)

	1st	H. A. Aitken, Leven
	2nd	S. Hall, Edinburgh
Tie	3rd	C. Hamilton, Loanhead
Tie	4th	Stanley Bennet, Edinburgh
Tie	5th	C. Carmichael, Barrhead
Tie	6th	M. A. Waddell, South Queensferry

SECTION 2.

(Those with handicaps over 15.)

	1st	R. Sturrock, Ardrossan
	2nd	R. Hamilton, Dalkeith
	3rd	James Bell, Dumbarton
	4th	C. J. Gregg, Paisley
Tie	5th	E. V. Chalmers, Dunblane
Tie	6th	A. Jamieson, Johnstone

Mr. James A. Maclay, the Captain, occupied the Chair at the Annual Meeting of the Golf Circle held in the evening. At the outset, Mr. Maclay made feeling reference to the death of Mr. D. D. Bruce, of Thurso, and members stood in silence. Secretary and Treasurer J. O. Scott having read the minutes of the last General Meeting and referred to the Accounts, Mr. John Wilson, of Dundee, was elected Captain for the coming year. A matter of handicapping rules was then dealt with. Next came a hearty welcome to the visitors present, and the re-election as Secretary and Treasurer of Mr. Scott—amid even greater acclamation than in previous years.

The President of the Association, Mr. A. S. Nisbet, was

present and, called upon for a speech, filled the bill extremely well, though confessing that he had never experienced the joys or sorrows of the game. Miss Nisbet, introduced by the Captain, then presented the prizes, the first of which went to Mr. H. A. Aitken, of Leven, whose feat and subsequent acknowledgment of his trophies brought down the house. The proceedings closed with a hearty vote of thanks to the Glasgow Golf Club, whose Vice-Captain had honoured the meeting with his presence, and by Mr. James Bell replying to a vote of thanks to the Committee, whose work had been so much appreciated.

THE BOWLING CUP.

The Bowling Competition was held, by the courtesy of the Wellmeadow Bowling Club, on the Wellmeadow Bowling Green, Paisley. Six rinks took part; and the results were as follows:

Winning Rink—27 *shots up.*—G. Thomson, J. M. Ferguson, J. Sharp, J. Smart (Skip).

Second Rink—22 *shots up.*—J. Simpson, A. H. Dunlop, H. B. Skea, A. Hannah (Skip).

After the competition the prizes were presented by Miss Nisbet, who had been " At Home " at the bowling green to ladies attending the meeting.

A TROPHY FOR THE LADIES' GOLF CIRCLE.

An innovation this year was a competition for the ladies, which was held over the Whitecraigs Course on Wednesday afternoon. Mr. R. W. Broadhead and Mr. J. W. M'Lusky had presented prizes, and these were respectively won by Mrs. J. W. M'Lusky with a net score of 72 and Mrs. Stanley Bennet with 73. Mrs. George Keillor was third with a return of 74.

After the competition, the ladies were entertained to tea by Mrs. M'Lusky at her house, and at a meeting it was formally decided to inaugurate the North British Ladies' Golf Circle, of which Mrs. M'Lusky was forthwith elected Captain.

The formation of this Circle caused much general interest; and in the course of the reception in Paisley on Thursday evening it was announced that Mr. W. H. Handley, of Elland, Managing Director of Messrs. Robert Dempster & Sons, Ltd., had graciously promised a challenge bowl and memento to be played for annually by the ladies.

The Gas Industry in France*

Comparison with Other European Countries

By H. LAURAIN, Director and Consulting Engineer to the Société du Gaz de Paris; Past-President of the Association Technique de l'Industrie du Gaz en France

It is useful to begin a survey of the position of the Gas Industry in France by considering the most recent statistics of the Industry, and by relating them to similar statistical information with regard to the position of the Gas Industry in other European countries.

The consumption of gas in the principal countries of Europe in 1931 is indicated by the following table:

—	Production or Annual Sale.		Consumption per Annum per Head of Population.	
	Millions of Cub. Metres.	Millions of C.Ft.	Cub. Metres.	C.Ft.
Great Britain	8879	313,560	198·2	7000
Holland (1930)	642	22,672	81·0	2860
Belgium (1930)	498	11,587	61·8	2182
Switzerland	240	8,476	60·0	2119
Denmark (1930)	216	7,628	59·9	2115
Germany	3573	126,356	55·4	1956
Austria	371	13,102	55·2	1949
France	1890	66,745	47·2	1667
Sweden	183	6,463	29·9	1056
Norway	38·9	1 374	13·8	487
Hungary	107·4	3,793	12·8	452
Italy	516	18,222	12·2	431
Czechoslovakia (1930)	115	4,061	7·8	275
Yugoslavia	14·3	505	1·0	35

Great Britain held the premier place, both for total production and for annual consumption per head of population. But the most interesting case is perhaps that of Switzerland, where the electrical industry is in a privileged position, due to the abundance and relative cheapness of hydro-electric current, while the Gas Industry is obliged to import all the coal which it requires. In spite of this unfavourable position, Switzerland occupies the fourth place among the countries of Europe as regards consumption of gas per head of population. And the growth of the total production is not less impressive, for, in ten years, the production has nearly doubled.

The sale of gas reached in France in 1931 the figure of 66,760 million c.ft., an increase of 1·3% on the previous year. The annual consumption in 1931 reached 80 cub. metres (2825 c.ft.) per consumer, and 47·2 cub. metres per head of population. The latter figure is to be compared with 60 cub. metres for Switzerland, and the difference indicates the possibilities of development which still exist in France.

Gas is produced in France in about 700 works, reckoning as one unit the several works which serve certain large towns; Paris, for example. Of these 700 works, four produce more than 1766 million c.ft. per annum, 16 produce from 353 to 1766 million c.ft. per annum, 29 produce from 177 to 353 million c.ft. per annum, and 140 produce from 35 to 177 million c.ft. per annum.

The quantities of coal carbonized during 1931 were as follows:

French coals	2,323,535 tonnes
Sarre ,,	596,809 ,,
Imported ,,	1,727,848 ,,
Total	4,648,192 ,,

The distillation of these coals has supplied

Coke available for sale	2,234,273 tonnes
Tar	233,862 ,,
Sulphate of ammonia	27,399 ,,
Benzole	11,874 ,,

Coke still remains a very valuable bye-product, and the basis of all development in the apparatus for handling and grading this commodity is the avoidance of breakage. Screens of several new types have been introduced.

Since the war, tar has been treated for the production of new products, phenol, fuel oils for industrial heating and internal combustion engines, cresols and cresyls for disinfectants, and, more recently, anthracene emulsions for the protection of fruit trees. But the new fact which dominates the whole of the tar industry is the employment of this commodity for the making and maintenance of roads. Particularly since 1922, by which time the numerous prejudices had been overcome, the Administration of the Ponts et Chaussées had decided upon the regular employment of tar for the maintenance of the main roads. In 1929, of 40,000 kilometres of national roads, 25,000 or 62·5% were tarred, and in 1931, 25,000 tonnes of tar out of 65,000 tonnes produced by the Ste. du Gaz de Paris—that is to say, nearly 40%,—were delivered to the Ponts et Chaussées, the remainder being distilled. The quantity of tar actually used in France for the roads is about 500,000 tonnes, of which only 200,000 tonnes is imported, but it is to be hoped that after the present crisis the French production will suffice to enable this importation to be dispensed with.

Another outstanding fact of recent years is the development of the use of benzole as fuel for automobile vehicles. The benzole is obtained either from the distillation of tar, or direct from coal gas. Benzole for this purpose is required to conform to a very rigorous specification, so that there is to-day nothing to fear from the use of this fuel. Particularly recent methods of production have resulted in the complete elimination of polymerization and " knocking " in use.

Gas is used for an increasing number of purposes for domestic and industrial cooking and heating. One of the more recent applications is that in the form of transportable compressed gas for use as fuel on automobiles. The Ste. du Gaz de Paris possesses to-day two plants for the compression of gas, one which has functioned for several years, and which is now equipped with a compressor of a capacity of 200 cub. metres per hour, the other which, recently completed, with a capacity of 60 cub. metres per hour, is destined to the supply of five loco-tractors of 90 H.P. for the railways. Compressed gas has also been used for the kitchens of the fish train on the State railways, which, in the year 1930, was supplied with gas from Paris. The tender contains 48 bottles, each of 8 cub. metres capacity, equivalent to that of a gasholder of 400 cub. metres capacity.

* From the Summer Number of *West's Gas.*

William Young Memorial Lecture*

Young, Beilby, and Some Experiments on the Carbonization of Coal

By F. S. Sinnatt, M.B.E., D.Sc., Director of Fuel Research.

This Association is the bearer of a torch which will only be extinguished when the process of the carbonization of coal ceases to be practised. William Young was, throughout his life, intensely interested in the process of carbonization, and placed his thoughts and researches before this Association in a long succession of papers, his name being connected with about 137 original papers and patents. On the occasion of the William Young Memorial Lecture the hurrying world can be reminded of the debt it owes to a remarkable man. As with other technologists engaged upon the development of large-scale processes, the real value of his contributions to science was not realized until after his death. The shale industry of Scotland, and the Gas Industry, should treasure his memory.

It is not necessary for me to review the contributions Young made to the Gas Industry; this has been done most ably by Dr. Daniell in an excellent paper, but I would recall that the Young and Beilby retort was adopted largely by the shale industry of Scotland, and upon it are based the methods used in modern vertical retorts. Everyone in the carbonization industries is familiar with the fact that Young and Beilby worked together in the development of their process of carbonization. It is not so well known that Young took out a patent, dated April 12, 1881, on "Improvements in the Manufacture of Oil and Ammonia," and that this patent was followed a month later (May 18, 1881) by a patent on similar lines by Beilby. Young and Beilby joined forces, and the result was their patent for a system of carbonization of shale; the essential idea of the new system was to subject the spent shale to a further treatment with steam in the oil-making retort, with the object of converting the residual nitrogen of the shale into ammonia. The magnitude of the industry, based on the Young and Beilby retort, may be gathered from a statement made by Beilby in 1897 that the number of retorts in use in Scotland consisted of Henderson 896, Young and Beilby 3636, and other kinds 396. This represented three Young and Beilby retorts to one of other types.

Lady Beilby has afforded me the opportunity of reading the late Sir George Beilby's own collection of the Young and Beilby patents, which contains valuable comments. It is interesting to record that Young and Beilby obtained a patent for the treatment of coal in the form of fine particles, anticipating certain recent work by over forty years.

As far as I can determine, the connection of Young and Beilby as joint patentees ceased in 1889, and from 1896-1905 Young was associated with Samuel and Thomas Glover in the publication of a number of patents. In 1905 Young wrote a wonderful series of articles on vertical retorts ("Gas Journal," 1906, Vol. 93, p. 560 *et seq.*), and stated that Mr. S. Glover was engaged upon the preparation of drawings for a vertical retort based on the Young and Beilby retort. This design appeared in the "Gas Journal," 1906, p. 758, under the title "Young and Glover's Vertical Retorts," and thus Young was responsible, in a large measure, for the development of the modern vertical retort.

Formation of the Fuel Research Board.

When, in 1917, the Fuel Research Board of the Department of Scientific and Industrial Research was formed, and a Director of Fuel Research was required to organize a programme of research, Sir George Beilby was, owing to his vast experience, the natural choice. He devoted himself unreservedly to the development of the programme of fuel research, and to the building of the Fuel Research Station. He gave his services without salary or recompense. The underlying principle of the Station is to enable the subject of the treatment of coal to be investigated on such a scale that the results can be applied directly by industry without further development, thus saving industry from much development research.

When Sir George Beilby took up the duties of Director of Fuel Research he enlisted the services of Prof. Thomas Gray, of the Royal Technical College, Glasgow, as the Superintendent of the laboratories at the Fuel Research Station. The design of the laboratories, and the general arrangement for the scientific work of the Station, are due largely to Prof. Gray. His was the guiding hand on all matters connected with the sampling and analysis of coal, and he acted as Chairman of the Committee on that subject under the Fuel Research Board. He was the director of the work carried out for the Scottish Shale Industry at the Royal Technical College, Glasgow, and later he became a member of the Fuel Research Board. Everyone in this Association will lament the death of Prof. Thomas Gray.

The work which has been in progress under the Fuel Research Board, since Sir George Beilby gave up the post of Director, has been the natural development of the programme he formulated, and it appears natural that an officer of the Fuel Research Station should describe to this Association certain of the developments of carbonization which have taken place at the Fuel Research Station during recent years.

I would like, in the first instance, to recall to the Association the fact that, in the early days of carbonization, retorts were made of cast iron, and since their cost was considerable the temperature of carbonization had to be kept sufficiently low to prevent their destruction. The process, therefore, was one which yielded a gas of high illuminating and calorific value, and a coke possessing the properties of modern low-temperature coke. With the introduction of clay retorts, and the consequent raising of the temperature of carbonization, greater volumes of gas were obtained, and the coke became harder and less readily ignitible. It was, in fact, not quite so suitable for the ordinary domestic appliances. The time is now here when smokeless combustion is required on all sides. It is recognized that gas is the most convenient smokeless fuel, but in its production the coke made must be suitable for all domestic purposes. It appears that the Gas Industry must continue the united attack it is making upon the coke problem, in order that the product may be suitable for all the requirements of the community.

I propose to describe certain of the more recent experiments upon the carbonization of coal carried out at the Fuel Research Station, selected as being of the greatest practical interest to this Association. This work must be considered as a whole, but it is convenient to divide it into three sections as follows:

(1) The carbonization of coal in narrow brick retorts.
(2) The carbonization of coal in horizontal retorts, with the introduction of steam.
(3) The heating of horizontal retorts with a view to increasing the throughput of the plant.

The Fuel Research Board, from its inception, has carried out investigations with the following principal objects: (*a*) To provide a supply of liquid fuel from home sources; (*b*) to ensure that the coal used in industry and for domestic purposes should be consumed efficiently, and (*c*) to ensure that it should be burned without the production of smoke or dust.

An "All-Purposes" Coke Needed.

One of the early problems to be considered was the supply of heat for domestic purposes, since it was recognized that some 30-35 million tons of coal are consumed annually in the raw state in domestic appliances. Much of the atmospheric pollution has been attributed to the domestic grate. Coal gas is an ideal smokeless fuel for domestic use, and for many industrial purposes, but at the time of the establishment of the Fuel Research Board the Gas Industry was hampered in its development by the existing legislation. The Board was asked to inquire into the question of the supply of gas, and as a result of their advice the Gas Regulation Act of 1920 was introduced. This gave the Gas Industry greater liberty, enabled it to sell gas on a thermal basis, and allowed it to develop its processes and resources. If the little figure seen on the recent advertisements of our foremost Gas Company is actually a therm, then the Fuel Research Board is largely responsible for bringing it into the world. It is a platitude to say that the gas and electric age is approaching for household purposes, but since some 60-65% of the weight of the coal carbonized has to be sold in the solid form, it should be suitable in properties for all domestic purposes. The consumer cannot be expected to maintain stocks of different solid fuels for separate purposes. Up to the present coke made in gas-works or coke ovens has not been found to suit all domestic requirements, although it is eminently suitable for certain purposes. Some of the objections to high-temperature coke for the open grate are overcome by installing special grates, but the cost of installation falls, as a rule, on the consumer. The problem of domestic heating, as it exists to-day, will

* Lecture before the North British Association of Gas Managers, Sept. 7, 1933.

only be solved when an " all-purposes " coke is made suitable for every domestic requirement.

Large-scale experiments are being carried out by a number of gas companies and coke manufacturers, both on blending and upon the production of special cokes. Smokeless fuel made by the carbonization of coal at lower temperatures, of which " Coalite " is an excellent example, can be used for all the purposes of the ordinary household.

The above considerations have been in the mind of the Fuel Research Board and led them to an investigation of the carbonization of coal at both so-called low and high temperatures. When the late Sir George Beilby planned the original programme on low-temperature carbonization, he had behind him the vast experience he gained with the Young and Beilby retort, and from his knowledge of the properties of cast iron he decided to experiment with metal retorts. The design of the earliest retorts built at the Fuel Research Station were based upon that used in the shale industry. After detailed investigation a " slot " retort was evolved. This retort had the following dimensions: 6 ft. 6 in. by 7 in. with an inverse taper to 11 in. and 21 ft. high. Many types of cast iron were tried in the course of the experiments. It was decided to aim at a retort which could be operated continuously or semi-continuously, but with the special design of retort mentioned above it was not possible to obtain cast iron which would withstand prolonged exposure to heat at temperatures of about 650° C. As a rule " growth " and distortion occurred within two years to such a degree that the retorts could not be operated. It is known that special cast iron is being used successfully in retorts of other design for the carbonization of coal at low temperatures.

A firebrick retort of the dimensions mentioned above was then erected, and operated so successfully that after two years it was decided to build a setting of two retorts under conditions which would enable a close estimate to be made of the cost of the setting. The setting of retorts has been described in Technical Paper No. 35, by Engineer-Captain J. Fraser Shaw, issued by the Department of Scientific and Industrial Research, and published by H.M. Stationery Office, Kingsway, W.C. 2. The following is a very brief description of the general construction and operation of the setting, a drawing of which is shown in fig. 1.

Fireclay panel bricks were used, and to obviate leakage specially designed interlocking bricks were obtained for the ends of the retorts. The setting was built throughout by the staff of the Fuel Reseafch Station, the charging hoppers being of general design, and the discharging arrangements supplied in part by the Woodall-Duckham Company, as used in their vertical retort system. The retorts are worked continuously or semi-intermittently with equal ease. The method of heating the retorts is of great importance in relation to their proper operation. They are heated by horizontal flues, and the whole of the fuel gas is introduced into the top flue. Inlets for air are placed at each turn in the heating flues, and as a rule no gas is burned on the lower half of the retort, which is heated by the sensible heat of the products of combustion. The top flue is only 9 in. from the castings at the top of the retort, and this flue is maintained at a temperature ranging from 900°-1170° C. according to the type of coal being carbonized. The inner surface of the retort is maintained at 600°-700° C. and the castings at the top kept cool by the incoming coal. With such a temperature gradient in the brick the maximum proportion of heat is applied to the thin layer of coal in the upper part of the retort. In certain cases substantially the whole of the gas required for carbonization is burned in the top flue, but with other coals it is necessary to apply heat in the lower flues. With medium caking coal in the form of nuts a top flue temperature of 1050° C. gives the best results, but, as the caking power of the coal increases, higher flue temperatures are necessary. The action of the retort may be explained broadly on the assumption that a skin of coke is formed, which allows of the steady downward movement of the charge. If the heating is applied too slowly the skin of the coal remains sticky, with the result that the charge " sticks " in the retort and " rodding " becomes necessary.

Producer Gas, Coal Gas, and Rich Gas Burner.

With the system of heating adopted it was necessary to design a special burner which would deal with producer gas, coal gas, and the rich gas from the carbonization of coal at lower temperatures. It was important to ensure that the burner could be used for gases of high calorific value, without the possibility of soot or carbon being deposited in the flues. The present burner, which is described in detail in Fuel Research Technical Paper No. 35, has been found to be quite satisfactory, and is, in fact, being applied more widely. It may be economical to burn the rich gas in the setting where a good market for the free-burning coke exists, and there is no outlet for the gas. The gas has a calorific value of the order of 750 B.Th.U. and is suitable for enriching water gas and for other purposes.

The setting of two retorts has now been in continuous operation for over fifteen months, and experiments have been carried out upon many types of coal. Some of the results of the carbonization experiments are given in Table 1. It may be added that the coke produced in all these experiments except the one in the last column was relatively free burning, while the tar was not dissimilar in properties to that obtained when coal is carbonized at low temperatures.

A special series of experiments was carried out to determine the effect of the temperature of carbonization and variation in throughput upon the properties of the coke and tar produced. It is known that crude high-temperature tar is not readily amenable to hydrogenation cracking, although the distillation products can be hydrogenated with great ease. It has been observed at the Station that the

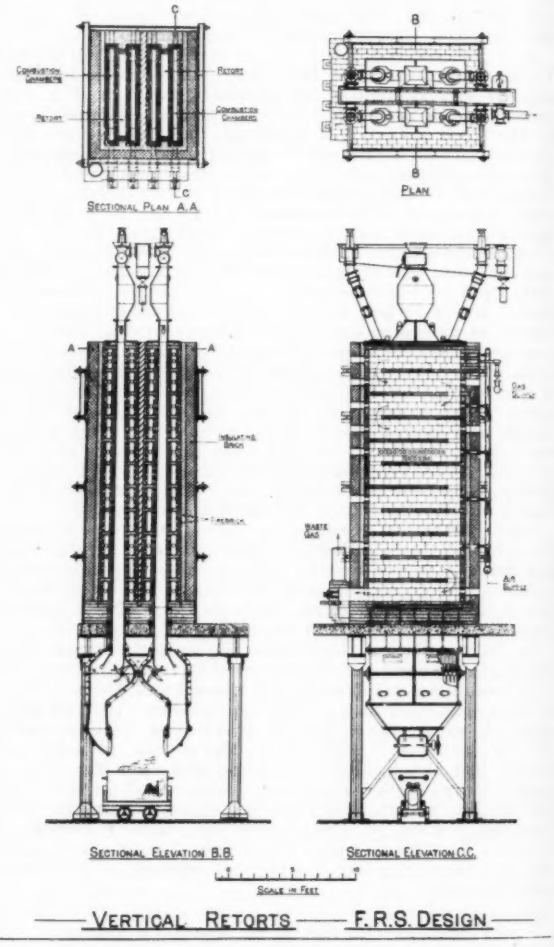


Fig. 1.—Narrow Brick Retorts.

temperature of carbonization has considerable influence upon the properties of the tar in relation to the ease with which it could be hydrogenated. The effect of the throughput of the retort and the temperature of carbonization upon the yield and properties of the tar will be found in Tables 2 and 3. It is interesting to note the order of the variations in the quantity and specific gravity of the tar with relatively small alterations in temperature and throughput. A more important property, not shown in these tables, is the rate at which the catalyst deteriorates. It has been found that, for a reasonable rate of deterioration, the specific gravity of the tar should be less than 1·055. The last column in Table 3 contains the proportion of spirit boiling up to 200° C. obtained when the crude tar is treated by hydrogenation-cracking. Continuous hydrogenation under uniform conditions and with further treatment of the product leads to a greater production of motor spirit, until finally 100% by volume is obtained.

In connection with the work on the narrow brick retorts it was necessary to determine, with the greatest possible accuracy, the temperature on the inner face of the retort. In the first retort horizontal grooves were cut in the face of

TABLE 1.—*Throughput and Yields Obtained in Narrow Brick Retorts.*

Coal.	Barnsley Seam	Parkgate Seam.	Durham "South Hetton."	"Grimethorpe."	"Singles" Caking.	"Smalls" Caking.	Higher Temperatures Durham "Thornley."
Throughput per retort per 24 hours, tons	10·1	6·3	5·4	5·2	8·4	6·0	6·5
Temperature of combustion chambers (mean), ° C.	1030	960	960	1050	1050	1025	1,215
Moisture in coal charged, %	3·4	1·7	2·7	7·6	6·2	6·6	1·3
Yields per ton of dry coal—							
Coke, cwt.	15·0	15·2	15·6	14·7	14·3	14·4	14·7
Coke, volatile matter, %	7·8	5·7	6·5	6·5	6·6	9·0	1·1
Gas, c.ft.	6700	9140	9300	7705	8800	6980	13,830
Gas, calorific value, B.Th U. per c.ft.	701	579	560	673	573	692	531
Gas, therms	47·0	52·9	52·1	51·9	50·4	48·6	73·4
Tar, galls.	19·1	12·9	11·0	16·8	18·2	13·9	10 9

TABLE 2.—*Results of Tar-producing Tests in Brickwork Retort.*

Coal.	Throughput per Retort per Day.	Temperature of Carbonization (approx.).	Tar.	
			Yield per Ton.	Specific Gravity.
	Tons.	° C.	Galls.	
Barnsley ("Dalton Main")	10·0	800	18·2	1·075
Durham, run-of-mine	7·0	715–725	12·3	1·108
Durham, run-of-mine	4·2	715–725	10·3	1·104
Durham ("South Hetton")	5·4	700–800	11·0	1·112
Parkgate ("Mitchell Main").	6·3	..	12·9	1·096
Standard of comparison— Barnsley Seam (cast-iron retort)	5·0	625	20·0	1·049

TABLE 3.—*Tars from Brickwork Retort using Barnsley Coal*

Test No.	Throughput per Retort per Day.	Temperature on Inner Face of Retort.	Tar.		Yield of Spirit up to 200° C. on Hydrogenation.- One Treatment.
			Yield per Ton.	Specific Gravity.	
	Tons.	° C.	Galls.		%
3.	5·4	600–630	18·3	1·056	34·7
4.	5·4	630–660	..	1·063	31·5
5.	5·4	660–690	18·6	1·073	33·0
6.	4·2	560–590	18·2	1·046	32·8
7.	4·2	570–600	18·8	1·057	30 3
8.	4·2	500–680	18·2	1·051	34·7
9.	7·5	650–750	17·0	1·055	32·7
2.	10·0	600–790	18·0	1·075	28·6
Standard of comparison — Barnsley Seam (cast-iron retort)	5·0	625	20·0	1·049	33·0

the retort, and into these sheaths for pyrometers were laid. This arrangement was found to be unsatisfactory, as the temperature recorded depended upon local and temporary conditions. In the new setting of narrow retorts horizontal holes were drilled in some of the brick courses, and thermocouples were inserted to determine the temperature in the centre of the brickwork. Observations were made of the temperature of the inner face of the retort, and of the temperature inside the brickwork, and in the combustion chamber with the retort empty. From the data thus obtained it was possible to ascertain the temperature of the inner face of the retort while it was in operation, and these temperatures are quoted in the tables.

The design for the above setting of two retorts was based on a single narrow retort built of ordinary firebrick. This first narrow firebrick retort was in operation for over two years, and was only a preliminary experiment. Before the retort was dismantled the temperatures in the whole of the flues were raised to 1250° C. The retort continued to work quite smoothly, and the products were similar to those obtained by the high-temperature carbonization of coal. The coal used was run-of-mine Durham coal, possessing the highest coking qualities. The throughput of the retort was maintained at 6·5 tons per day, and the following yields were obtained:

75·5 therms of gas having a calorific value of 531 B.Th.U., and

14·7 cwt. of coke.

Before drawing attention to the results obtained at lower and higher temperatures, two further observations made at the Fuel Research Station must be noted:

(i.) During the carbonization of coal at temperatures below 700° C. the formation of scurf in the brick retort was found to take place only slowly. After operating the narrow brick retort for twelve months the minor axis had been reduced from 7 in. to 5 in. and still no difficulties were experienced in the operation of the retort with the scurf present, and no reduction in the throughput of the retort was detected.

(ii.) A cast-iron retort, having the same dimensions as the brick retort, except that the narrow dimension was 4½ in. with an inverse taper to 7 in., was in use at the Fuel Research Station for nearly two years. Many kinds of coal were carbonized in this retort, which was operated both continuously and semi-intermittently.

If the above observations are summarized it would appear that all types of coal can be carbonized continuously or semi-intermittently in retorts with a narrow dimension of 4½-7 in., and with an inverse taper ranging from 7-11 in. The retorts can be operated at both low temperatures and at high temperatures, and the coke obtained varies in its properties chiefly as a result of the temperatures prevailing in the lower reaches of the retort.

For example, when carbonizing coal from the Barnsley Seam at a throughput of 10 tons per retort per day, the temperatures in the top combustion chambers would have to be 1170° C. to obtain a temperature of 600° C. on the inside surface of the retort. If now the lower combustion chambers are maintained at such a temperature that no position on the inside face of the retort exceeds 700° C. the coke produced will be free-burning in the ordinary domestic fireplace. If, on the other hand, the temperatures in the lower combustion chambers are increased to 1200°-1250° C., the products produced are the same as those ordinarily obtained from the high-temperature carbonization of coal. Of course, in the case of high-temperature carbonization the top portion of the retort would be affected by the higher temperature of the gases coming from the coal in the lower part of the retort.

A Plant with Possibilities.

It would appear that the essential feature of the system is to heat the coal as rapidly as possible in a layer not exceeding about 7 in. in thickness. It has been decided to explore this question in greater detail, and a narrow retort built of silica will be constructed to determine the effect of higher temperatures upon the carbonization products, and, in addition, to ascertain if so-called low-temperature carbonization products can be obtained with even higher temperatures prevailing in the upper flues of the retort. In the meantime the results merit your attention, as the method appears to be a flexible one, and may be capable of producing a free-burning coke with a high yield of low-temperature tar, and by changing the temperature in the flues, high-temperature products can be obtained. As far as the experiments have proceeded it would seem that the throughput of the plant is not materially affected by the change in temperature.

Research on Horizontal Retorts.

The second programme upon the carbonization of coal is that proceeding on horizontal retorts. Some 800 undertakings in Great Britain are equipped with horizontal retorts dealing with about 34·3% of the coal carbonized in gas-works; 48 works have both horizontal and vertical retorts dealing with about 30·8% of the coal carbonized in gas-works, while 10 undertakings are working horizontal, inclined, and vertical retorts, and deal with 20·5% of the coal carbonized; 167 works operate vertical retorts only (14·4%). These figures are based upon the information published in the *Gas World* Year Book for 1933, in which the number of undertakings in Great Britain is given as 1332, but of which about 300 have not been classified. The total coal carbonized in 1932 in the gas-works of the country was 17·7 million tons. Before the Fuel Research Board commenced the investigations upon horizontal retorts the Gas Industry was consulted, and the programme of work is based on the combined suggestions made by the gas engineers, who answered the letter addressed to them by Mr.

Tagg. Technical papers have been published describing some of the results. Within the last year the suggestion of Mr. Madden, Engineer and Manager of the Cardiff Gas Light and Coke Company, and formerly a member of the Fuel Research Board, that the subject of the introduction of steam into horizontal retorts should be re-examined was implemented. The setting was accordingly fitted with the necessary piping, as shown in fig. 2. The steam passes through a reducing valve followed by a steam trap and steam meter. The steam pipes on each side of the discharge end of the setting, and those leading to the retorts, are of ample dimensions. Each of these pipes is fitted with a cock, and the steam enters the retorts through an orifice ⅛ in. diameter. The steam is allowed to enter the retorts at the discharge end only, the gas outlet at the discharge end being closed. The ordinary method of heating the retorts is used, and no increase has been made in the amount of coke used in the producer.

Several methods of manipulating the retorts have been tried. In the first a plug of " green " coke about 3 ft. in length was allowed to remain in the retort. The plug of coke was pushed to the discharge end and came into contact with the door of the retort when it was closed. The retorts were charged as full as possible, 13·5 cwt. of coal, and the time of carbonization was 12 hours. The proportion of steam used in these experiments was 2% per hour of the weight of the coal, and it was introduced into the retorts during the last 2 hours. The yield of gas expressed in therms per ton of coal was 84·5, the gas having a calorific value of 528 B.Th.U. The average yield without the introduction of steam was 75 therms of gas having a calorific value of 550 B.Th.U. Further experiments have shown that there is little to be gained by adopting special methods of charging, provided the retorts are fairly full of coal. With charges of 12 cwt., and a throughput of 10 tons a day, it was found that the steam could be introduced during the last 3 hours, but not for longer periods without lowering the temperature of the retorts. A yield of 87 therms as against 75 therms was obtained by this treatment. When the throughput of the plant was raised to 11 tons a day, with 12 cwt. charges, steam could only be introduced for the last hour without the temperatures of the retorts falling. As mentioned previously, the experiments were limited by the amount of coke used in the producer. No increase in this coke was made during the experiments. Some of the results obtained are given in Table 4.

We understand that one gas-works has carried out some experiments recently on steaming in retorts, and the first trials appear to be fairly successful. A considerable number of questions still remain unanswered, and work is in progress at the Fuel Research Station. As a first approximation it may be said that about 80% of the steam introduced into the retorts was decomposed.

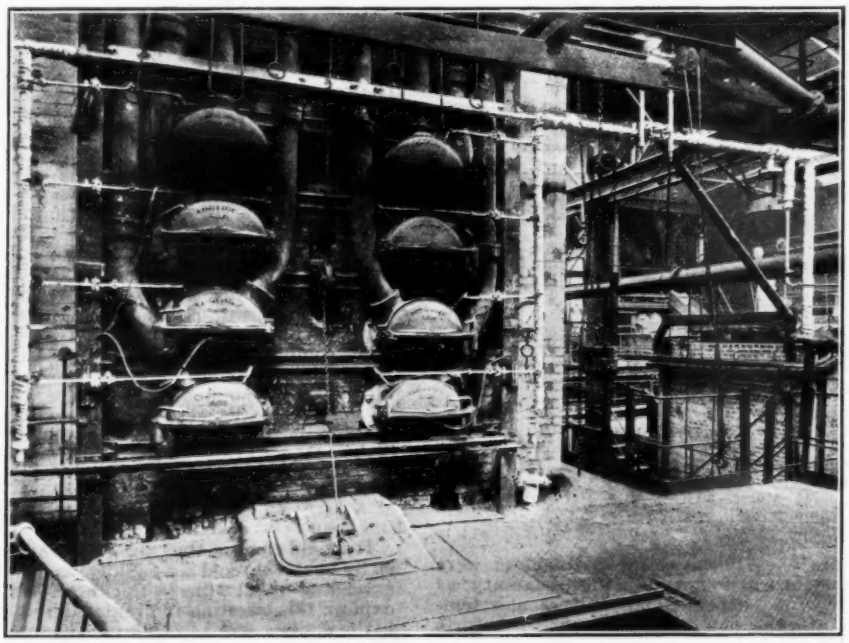


FIG. 2.—ARRANGEMENT OF STEAM SUPPLY TO HORIZONTAL RETORTS AT THE FUEL RESEARCH STATION.

Increasing Throughput.

One of the programmes of work at the Fuel Research Station is an inquiry into the design of the furnaces which are being used in the retort settings, and in furnaces where coal is being burned. The more fundamental aspects of the subject of heat transmission have been examined in a book entitled " The Calculation of Heat Transmission," by Fishenden and Saunders, formerly members of the staff of the Fuel Research Organization. As a result of the general investigations at the Station the system of heating the narrow brick retorts was devised, and a special burner was designed. A study was made upon the design of a coal gas induction burner for a horizontal retort setting, and published in Technical Paper No. 38. In studying furnaces connected with the horizontal retorts it was observed that the throughput of the retorts could be increased above its rated capacity by increasing the volume of the heating gases being circulated round the retort.

The early experiments were carried out after the setting had been in operation for five years, and after a certain amount of data had been obtained it became essential to rebuild the setting.

In the first experiments in the old setting Durham coal was carbonized, and the throughput raised from the rated value of the setting, 10 tons a day, to 17 tons a day. With South Yorkshire coal the throughput was raised from 10 tons to 18 tons a day. In the case of the Durham coal the greater throughput was accompanied by a decrease in the yield of gas by 2·5 therms per ton, although the thermal output of the setting in the form of gas was increased from 95 to 156 therms per day. In the case of the Yorkshire seam the decrease in therms per ton was 3, while the thermal output per retort increased from 96 to 166 therms per day. It is important to observe that difficulty has been experienced in determining the throughput of the setting to be used as a datum line. According to the original contract the setting was capable of dealing with about 10 tons a day, but we have been informed that similar settings are dealing with much larger quantities. It must be pointed out, however, that the setting at the Fuel Research Station is a single setting of 8 retorts, and in consequence the heat losses are probably considerably greater than are found with a greater number of units.

A number of methods of increasing the volume of gas passing round the retorts have been used. In the early experiments the amount of air entering the retort setting was allowed to rise, and thus the carbon dioxide in the exit gases was lowered. In a further series of experiments the increased volume of the heating gases was obtained by withdrawing flue gases from the flue leading to the chimney, and returning the gas to the secondary air ports by means of fans. Air to the producer was supplied under slight

TABLE 4.—*Steaming in Horizontal Retorts.*

Conditions.	Steam Supplied. Lb. per Ton of Coal as Charged.	Coke to Producer. Cwt. per Ton.	Yields per Ton of Coal as Charged.					Remarks.
			Gas. C.Ft.	Gas. C.V.	Gas. Therms.	Tar. Galls.	Liquor. Galls.	
12 cwt. charges; no steam; throughput 10 tons per day. (Test 22)	*Nil*	4·2	13,640	550	75·1	10·0	10·1	—
12 cwt. charges; steam last 2 hours; throughput 10 tons per day. (Test 16)	91·8	4·18	16,260	520	84·6	7·6	16·6	6 days. Gas yield and calorific value constant. Temperatures steady.
12 cwt. charges; steam last 2 hours; throughput 10 tons per day (Test 18)	77·9	3·92	16,450	513	84·4	8·4	15·8	5 days Gas yield and calorific value constant. Temperatures steady.
12 cwt charges; steam last 3 hours; throughput 10 tons per day. (Test 20)	128·5	4·2	16,980	512	86·9	9·1	20·1	3 days. Gas yield and calorific value constant. Temperatures steady.
12 cwt. charges; steam last 4 hours; throughput 10 tons per day. (Test 21)	174·3	4·2	18,270 17,700	475 504	86·8 89·2	8·4	21·5	6 days. Gas yield and calorific value varied. Temperatures fell.
12 cwt. charges; no steam; throughput 11 tons per day. (Test 25)	*Nil*	3·8	13,340	580	77·4	9·3	9·7	Yield seems unduly high.
12 cwt. charges; steam last 1 hour; throughput 11 tons per day. (Test 29)	53·9	3·8	14,800 14,720	533 542	78·9 79·8	8·9	10·3	4 days. Gas yield and calorific value constant. Temperatures steady.
12 cwt. charges; steam last 2 hours; throughput 11 tons per day (Test 28)	85·8	3·7	15,910 15,140	538 549	85·5 83·1	9·9	14·4	4 days. Gas yield and calorific value varied. Temperatures fell.
12 cwt. charges; steam last 4 hours; throughput 11 tons per day. (Test 26)	177·7	3·7	16,350 15,160	531 541	86·8 82·0	9·0	24·2	5 days. Gas yield and calorific value varied. Temperatures fell.
12 cwt. charges; steam last 1 hour; throughput 11 tons per day. (Test 30)	74·1	3·7	15,950 15,430	525 520	83·7 80·2	..	..	5 days. Gas yield and calorific value varied. Temperatures fell.
12 cwt. charges; steam last 1 hour; throughput 11 tons per day, with increased volume of heating gases. (Test 31)	83·0	4·0	17,140 15,540	490 523	84·0 81·3	..	..	6 days Gas yield and calorific value varied. Temperatures fell slightly.

pressure, and a temperature of 1350° C. was maintained in the combustion chamber. The volume of flue gas circulating round the retorts was raised from 27,000 c.ft. to 76,000 c.ft. per hour, measured at N.T.P., and the coke required in the producer was 4 cwt. per ton of coal car-

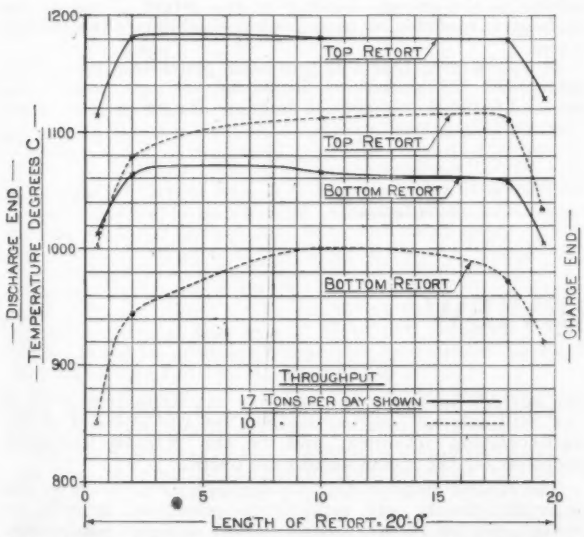


Fig. 3.—Surface Temperature Explorations of a Top and Bottom Retort.

bonized instead of 3·4 cwt. In addition to this increase in the amount of coke required for carbonization, 0·4 cwt. of coke was required to supply the mechanical power for the fans required to circulate the heating gases through the setting, and to provide for the extra draught required at the chimney. At the end of each carbonization period in the retorts the internal temperatures, which were measured at definite positions, were the same, although the period of the charge ranged from 11·3 hours to 6·4 hours. Explorations were made of the surface temperatures of the retort while carbonizing at the rated throughput of the setting, and at the increased throughput. Typical results are shown graphically in fig. 3.

It will be observed that with the larger volume and increased velocity of the gases there is a definite raising of the temperature at the ends of the retorts without affecting the temperature at the centre of the retorts. In order to obtain uniformity of heating it was arranged to sample the waste gases leaving the bottom of the retort at four positions along the length of the retort. Provision was also made to determine the surface temperature of the retorts on the side remote from the combustion chamber. No practical difficulties were encountered when operating at the higher throughputs, except that the offtake pipes required cleaning at shorter intervals. It is interesting to record that it was not necessary to scurf the retorts more frequently with the higher rates of carbonization. When carbonizing at the rated throughput of the setting the accumulation of scurf interfered with the working of the charging machine when about 500 tons of coal had been carbonized, but with the increased throughput 850 tons were treated before scurfing was necessary.

The results obtained for a rated and a maximum throughput with Durham coal are shown in Table 5.

TABLE 5.—*Horizontal Gas Retorts—Increased Throughput Producer-Gas Heating.*

Throughput for setting of eight retorts per day, tons	10·0	17·0
Weight of charge, cwt.	12·5	12·5
Period of carbonization of charge, hours	12·0	7·1
Moisture in coal as charged, %	1·8	1·2
Carbon dioxide content of waste gases leaving setting, %	19·0	18·3
Gas—		
Calorific value, B.Th.U./c.ft.	571	571
Yield per ton of coal as charged, therms	76	73·5
Yield per retort per day, therms	95	156

At the time when this series of experiments was completed the retorts had been in operation for about six years, and were nearing the end of their useful life. They were not in sufficiently good order for further experiments in which accurate carbonization data had to be obtained. It was therefore decided to dismantle the setting as far down as the recuperators. It had been found in these retorts that carbonization was slowest in the bottom two. Ac-

cordingly, in the rebuilt setting the retorts were raised by 1 ft. in order that the bottom tier would undergo better heating. A further innovation was an arrangement for supplying air at the top of the setting. It was thus possible to bring about delayed combustion by burning only a portion of the gas in the combustion chamber proper, the remainder being burned after passing over the crown of the top retorts. In this way the sides of the retort remote from the combustion chamber could be better heated. It was also arranged that flue gases could be supplied either directly through the producer or through the secondary airports, or to both simultaneously as desired.

When this new setting of retorts was put into operation more powerful fans were installed in order to increase the volume of the heating gas, as it was thought that a higher throughput could be obtained with more flue gases. The maximum volume made use of in this way has been 105,000 c.ft. per hour, as against a maximum of 76,000 c.ft. per hour in the old setting. This expectation of a higher throughput did not materialize, as it was found impossible to go beyond 16·2 tons per day; this was only obtained when the volume of heating gas was 105,000 c.ft. per hour.

Experiments have been carried out with flue gases supplied through the secondary airports, through the producer, or through both of these at once. With none of these three methods could the throughput be increased to the value obtained in the old setting. The most effective method of the three was that in which the flue gases were supplied through the producer alone.

The results are shown in Table 6.

It is interesting to note that the fuel gases obtained when this expedient was adopted had a calorific value of 40 B.Th.U.

It is interesting to compare the surface temperatures measured in the largest gas circulation in the new setting with those measured in the case of the old setting. These figures are shown in Table 7.

TABLE 6.—*Results with Various Methods of Flue Gas Circulation.*

Method.	Throughput.	Gas Yield per Ton.	Coke Consumption per Ton of Coal.	Gas Passing Retorts.
	Tons per Day.	Therms.	Cwt.	C.Ft. per Hour.
(i.) . . .	15·8	73·0	4·11	78,000
(ii.) . . .	13·3	76·6	4·75	78,600
(iii.) . . .	16·2	73·8	5·00	105,200

(i.) Gases passed through the producer.
(ii.) Gases passed through secondary air ports.
(iii.) Gases passed through both (i.) and (ii.).

Temperatures on Outer Surfaces of Retorts with Various Methods of Flue Gas Circulation.

Method.	Retort.	Temperature, ° C.				
		Discharge End.		Centre.	Charge End.	
		(*a*)	(*b*)		(*b*)	(*a*)
(i.)	Top tier	1190	1225	1245	1185	1165
	Bottom tier	1005	1075	1120	1055	1005
(ii.)	Top tier	1140	1185	1210	1190	1170
	Bottom tier	970	1040	1100	1070	1020
(iii.)	Top tier	1165	1200	1200	1175	1155
	Bottom tier	1030	1085	1100	1070	1015

(*a*) Temperature measured 6 in. from end of retort.
(*b*) Temperature measured 2 ft. from end of retort.

TABLE 7.—*Temperatures on Outer Surfaces of Retorts in Old and New Setting.*

—	Retort.	Temperature, ° C.				
		Discharge End.		Centre.	Charge End.	
		(*a*)	(*b*)		(*b*)	(*a*)
Old setting—17 tons per day, 76,000 c.ft. of gas passing the retorts per hour . . .	Top tier	1120	1100	1180	1180	1130
	Bottom tier	990	1065	1065	1060	1010
New setting—16·2 tons per day, 105 200 c.ft. of gas passing the retorts per hour	Top tier	1165	1200	1200	1175	1155
	Bottom tier	1030	1085	1100	1070	1015

(*a*) Temperature measured 6 in. from end of retort.
(*b*) Temperature measured 2 ft. from end of retort.

It will be seen that the surface temperatures are considerably higher in the case of the new setting, and three reasons can be suggested for this. First, the alteration in the thermal conductivity of the retort material with age and the reduction in the effective thickness of the retort might account for part of the differences. Secondly, in the new setting arches were substituted for solid brick walls. Thirdly, the angle of incidence of the secondary airports was altered in the new setting. It is thought that this has led to greater turbulence in the combustion chamber.

When the flue gases were passed through the producer, trouble was experienced due to overheating of the producer door, but this can be avoided by designing a suitable door.

The steaming experiments being carried on at the Fuel Research Station have already been mentioned, and the future programme of work intended for the setting of horizontal retorts includes experiments in which steam will be added to the charge, heating of the retorts being at the same time modified by increasing the volume of the heating gases.

It would seem that this technique provides a method by which the throughput of horizontal settings may be increased to meet any special demands for an increased production of gas.

BOOK REVIEW

THE COKE OVEN AND BYE-PRODUCT INDUSTRY.*

The fifth edition of this well-known book has been prepared by O. Dittmer and O. Kruber and is dedicated to the original author who has this year celebrated his seventieth birthday. The volume deals with a very wide subject in a small compass, and the treatment is therefore very cursory in parts. Nevertheless, some useful information is given covering recent German developments in the coke oven and bye-products industry, and, in view of this, the book forms a useful supplement to Gluud's standard treatise.

The book is divided into three chapters dealing respectively with carbonization, bye-products, and tar. The first chapter includes an historical account of the development of the bye-product oven, a summary of methods of coal treatment, a description—very profusely illustrated—of modern types of German ovens, and information covering battery operation and control. An account is given of the Still internal suction method for the removal of the carbonization products, and of the recently described methods for the steaming of coke ovens.

The second chapter deals with ammonia recovery by the indirect, direct, and semi-direct processes, benzole recovery, phenol recovery from liquor, and gas purification. This section includes a description of the Feld washer.

The final chapter deals with the properties, uses, and distillation of tar, and contains, in addition, sections devoted to pitch, light oil, and benzole products, pyridine bases, coumarone resins, middle oil, carbolic acid, heavy oil, naphthalene, anthracene, carbazole, and creosoting oils. A little information is given, also, covering the lubricating oils made, during the war, from tar. A number of analytical methods are described in this chapter and in the preceding one. A useful appendix contains, in order of boiling-point, a list of all the chemical compounds which have, with certainty, been identified as occurring in coal tar.

* Kokerei und Teerprodukte der Steinkohle (Fifth Edition). By A. Spilker. [Halle (Saale), 1933, Wilhelm Knapp. Pp. VIII. + 198. Price RM. 9·80 unbound, RM. 11·30 bound.]

Association of Public Lighting Engineers

ANNUAL MEETING AT MARGATE

The Tenth Annual Meeting and Conference of the Association of Public Lighting Engineers was held at Margate from Sept. 4-7, under the Presidency of Mr. E. M. SEVERN, of the South Metropolitan Gas Company, who was inducted into the Chair during the course of the meeting.

The members and delegates were kept busy at meetings on Tuesday and Wednesday, Sept. 5 and 6, for there were business sessions during the mornings and afternoons of both days; they were entertained at luncheon on Tuesday by the Isle of Thanet Gas Light and Coke Company, and the Association held its official luncheon on Wednesday, which function provided an opportunity for it to entertain a number of guests, who included many of those who have helped in the organization of the meeting.

As a preliminary to business, however, the members and delegates attended a reception by the Mayor and Mayoress of Margate (Alderman F. L. Pettman, J.P., C.C., and Mrs. Pettman) at the Winter Gardens on Monday, Sept. 4. A cabaret and dancing were enjoyed.

DEMONSTRATIONS OF NEW LIGHTING EQUIPMENT.

As in previous years, some practical demonstrations were given of the latest types of street and flood lighting, both by gas and electricity, in the vicinity of the meeting, by various firms.

So far as gas lighting was concerned, Messrs. Sugg & Co., Ltd., provided an installation of "Multi-ray" reflectors fitted to twelve existing lamps, in Ethelbert Crescent; and some "K" type directional reflectors fitted to existing lamps, on Queen's Promenade. This firm also provided a 3-way fitment to an existing column on Queen's Promenade, with three 5-light "Rochester" suspension lamps each fitted with Holophane refractor bands. Other outstanding demonstrations by Messrs. Sugg were the floodlighting of the eastern elevation of the Queen's Hotel and of the flower beds, &c., at the war memorial gardens.

Messrs. Keith & Blackman Company, Ltd., provided an installation of five of their latest high-pressure lamps, each fitted with cluster burners and suspended from gibbet arms on 25-ft. columns. These were also fitted with Messrs. Keith Blackman's latest pattern raising, lowering, and traversing gear. The ordinary gas pressure is raised by the Keith Blackman rotary compressor direct coupled to an electric motor.

The five steel columns used in this installation were supplied by the Bromford Tube Company, Ltd. They were made from hot finish weldless steel tubing and were in one piece, and fluted and stepped. Three designs were erected.

Messrs. C. H. Kempton & Co., Ltd., had an installation of twelve of their new double-way reflector lamps (the "Kempar") fitted with No. 1 Bijou mantles each side. These were erected on existing columns, which were raised to the required height by 2-ft. extension pieces. The lamps were controlled by the Horstmann Gear Company's "Newbridge" electro-catalytic gas switch.

Messrs. Parkinson & Co., Ltd., installed a range of designs of U type fixing lamps, having all the latest improvements, including the new "Mor-lite" reflector. The lamps, fitted to existing columns, were operated by clock controllers supplied by Gas Meters, Ltd.

The Horstmann Gear Company, Ltd., demonstrated their latest type of controller—*i.e.*, the "Newbridge" electro-catalytic gas switch, on a number of existing lamps.

Messrs. Holophane, Ltd., arranged a demonstration of a new form of prismatic refracting dish, fitted in the base of the clear glass globes of pendant cluster gas lanterns. Some 5-light "Littleton" lanterns were adapted for these refracting dishes, to illuminate the Newgate Promenade. The dish refractor is for use with groups of gas mantles for street lighting. It is designed to fit beneath the group of mantles and so control a considerable volume of light. It allows a certain quantity of light flux to be transmitted, however, thus illuminating the region in the neighbourhood of the posts to a sufficiently high intensity. Although the prismatic elements deviate the light in a vertical plane so as to reach the roadway at some distance from the posts, and also concentrate the light laterally into two beams at 160° to one another, they are limited to one side of the glassware, the other side being quite smooth. Further, the system can be accommodated easily and conveniently in either square or pendant lanterns. The intensity obtained by this refractor in the main directional beams is four times that of the bare cluster.

TUESDAY, SEPT. 5.

The members and delegates assembled at Cliftonville Hall on Tuesday morning, and were accorded a hearty welcome by the MAYOR OF MARGATE. Since the Association was formed, he said, it had made its influence felt, and the vast improvements effected in public lighting were improvements of which one might well be proud. Anyone who had had experience of public lighting, even in London, fifty years ago and who had witnessed the improvements effected since must be proud to be associated with such a body as the Association. Margate was not backward in the matter of public lighting.

Mr. H. DAVIES (Chesterfield), the retiring President, expressed thanks to the Mayor for the reception he had accorded the members and delegates; he also expressed thanks to the Margate Corporation and its officials for their contributions to the Association's proceedings by way of papers and discussions, and for appointing delegates to the conferences.

INDUCTION OF NEW PRESIDENT.

Mr. DAVIES, introducing his successor—Mr. E. M. Severn (South Metropolitan Gas Company)—said that he was one of the stalwarts of the Association and had served as Hon. Treasurer. On behalf of all the members, he wished Mr. Severn a successful year of office.

Mr. Severn was then invested with the Presidential chain and badge, and formally occupied the chair.

PRESIDENTIAL ADDRESS.

The President then delivered his Address, an extract from which was published in the "JOURNAL" last week.

Following the Address, Mr. Severn referred to some statistics showing the life-preserving rôle of street lighting. In one section of roadway the number of accidents during the winter before it was re-lit was 203, but in the winter after it was re-lit the number was reduced to 174.

A diagram was also shown, from an American paper, indicating the progressive decrease in the number of accidents as the expenditure *per capita* on street lighting was increased.

THE PUBLIC LIGHTING OF MARGATE.

Mr. H. V. Emptage presented his paper on this subject, an extract from which will be found elsewhere in this week's "JOURNAL."

Following the paper, Mr. Emptage drew attention to a gas directional traffic signal, worked out by the Horstmann Gear Company in co-operation with the South Metropolitan Gas Company, which was not yet on the market, but was available for inspection at Margate.

A hearty vote of thanks was accorded Mr. Emptage for his paper, and for his services in connection with the demonstration lighting installations at Margate.

THE LIGHTING OF SEASIDE AND HEALTH RESORTS.

Mr. W. N. C. Clinch presented his paper on this subject, which is published elsewhere in this issue.

Following the paper, he exhibited numerous photographs of the decorative lighting of buildings, promenades, fountains, gardens, &c.

LUNCHEON.

At the invitation of the Isle of Thanet Gas Light and Coke Company, the members and delegates lunched at the Queen's Highcliffe Hotel. The Company's guests also included the Mayor and Mayoress of Margate and many officials of the Corporation. Mr. J. M. Campbell (Engineer and General Manager to the Company) and Mrs. Campbell were also present.

Mr. WALTER HILLS (Chairman of the Company) presided and offered to all the guests a sincere and hearty welcome. In a short but whimsical speech he said it would be unpardonable on his part to curtail the already limited time at the disposal of those attending the conference, and who would have the pleasure and privilege of listening to eminent men who would know what they were talking about.

Prof. E. W. MARCHANT (President of the Institution of Electrical Engineers), proposing a toast to the Association,

said that public lighting engineers had rendered very useful service by helping to produce the specification, issued by the British Standards Institution, for the measurement of illumination. He had come across cases in which great economies had been effected by the use of the methods referred to therein. Recently he had seen many references to " Mr. Therm," a gentleman who, apparently, could do a great many odd jobs, such as cooking a dinner, &c., and who never wanted a night off. In the representations which he (Prof. Marchant) had seen, however, Mr. Therm was a black man—and there was a suggestion that he came from the infernal regions. There was another person of almost equal interest, however—a " Mr. Kilowatt-Hour." He did not think this latter gentleman was a black man; he would be white. He was a good, strong, hefty fellow, who could do many odd jobs besides making heat, as, for instance, the sweeping of carpets. Apparently Mr. Therm and Mr. Kilowatt-Hour were seeking the favours of a certain " Miss Lumen," who must surely be an angel of light, for one could not imagine that a lumen could be anything but white and beautiful. He did not believe in mixed marriages, however. There might be occasions when such marriages were successful, and it was far from his purpose to suggest that gas should not be used for illumination; but there was something to be said in the other direction. Having to speak on behalf of electricity, he ventured to put forward that view.

Mr. C. VALON BENNETT (Senior Vice-President, Institution of Gas Engineers), who supported the toast, first expressed regret that the President of the Institution (Mr. Tarratt) was unable to attend the conference, for he was about to leave the country, with other gas engineers, to attend the American Gas Convention and to visit Canada also. The Institution appreciated the honour of being invited to send its representative to this conference. Although Prof. Marchant had spoken as the representative of electricity, he (Mr. Valon Bennett) was not speaking for gas, but as a representative of the Institution. All he would say with regard to Mr. Therm, Mr. Kilowatt-Hour, and Miss Lumen was that " Mr. Therm never lets you down." [Laughter.] Conferences such as this, he continued, might appear to be excuses for municipal officials to have a good time. Although those who attended enjoyed a good time, however, they really did good business, and such expenditure as was incurred by the authorities they served was repaid a thousand times. He did not blame the Association for selecting Margate for the conference this year; there was no reason why the members and delegates should not deliberate in the very best circumstances. The Institution of Gas Engineers had always taken a very great interest in the work of the Association. The first President of the Association was Mr. Langlands, who was connected with the Glasgow Corporation Gas Department; the second was Mr. C. S. Shapley, of Leeds, who had later become President of the Institution of Gas Engineers; the immediate Past-President was Mr. H. Davies, a gas engineer of whom his colleagues were proud; and the new President was connected with one of the largest gas undertakings in the world. Many other gas engineers had worked and were working on the Council. Not only had the Institution been interested in the work of the Association, but it had done all it could to assist. The Association's main object was to ensure that the public streets were illuminated in the most efficient manner at the lowest possible cost, and the Institution was anxious that that result should be achieved. " Economy " was not the prevention of spending; it was wise spending. It was important that a qualified lighting engineer should be appointed for every city and town of real size. The local authorities, and the purveyors of energy, whether gas or electricity, were to be congratulated. Margate was a town in which one felt welcome because its streets were properly illuminated. The installation of centrally suspended units and the fitting of directional reflectors had done much to make our thoroughfares safe in these days of swiftly-moving traffic. This was largely the result of the work of the Association, and he urged its members not to be weary of well-doing, but to ask the Institution of Gas Engineers, and the Gas Industry in general, for any help they needed, which, if it could be given, would be given willingly.

Mr. H. DAVIES (immediate Past-President), in his response, said the Association had done a great deal to instil into the minds of municipal authorities the fact that, whereas the lighting value given to them had been more than trebled, the cost of the power used had been reduced considerably. The lighting of the streets in the towns of Great Britain had improved enormously, without extra cost to the ratepayers. When the Association was formed, ten years ago, the membership was 83; to-day, however, it was 237, the increase for the last twelve months being 47. That indicated the interest it had aroused in public lighting. He emphasized that the membership comprised not only lighting engineers and their assistants, but also the makers of apparatus. Referring to specifications, Mr. Davies emphasized that, although the Association was assisting in their production, it was not the purpose of British standard specifications to standardize equipment. Finally, he expressed indebtedness to the delegates, and the municipalities they served, for their great support.

The PRESIDENT proposed a toast to the Isle of Thanet Gas Light and Coke Company, and its Chairman, and expressed gratitude for its hospitality to the Association. He also expressed thanks for the help which the Company had afforded in connection with the conference and the lighting demonstrations, and the facilities given to exhibitors.

The CHAIRMAN, who was received with prolonged applause, assured the guests, on behalf of himself and his co-Directors, that it had been a delight to welcome and entertain them. Inasmuch as the time available was limited, he would not do more than mention the Company's long-continued efficiency, under the supervision of its very able Engineer and General Manager, Mr. J. M. Campbell.

WEDNESDAY, SEPT. 6.

The business of the annual general meeting of the Association was proceeded with on Wednesday morning, Sept. 6.

The retiring President's badge and Presidential Certificate were presented to Mr. H. Davies, the immediate Past-President.

Mr. DAVIES took the opportunity to thank the members as a whole for the support they had accorded him during his year of office. He looked forward, he said, to very great development of the Association's work and to the time when the Association would be one of the premier bodies in the country.

ANNUAL REPORT AND ACCOUNTS.

The Annual Report of the Association for the year 1932-33 was presented by Mr. E. J. Stewart, of Glasgow (Hon. Editor).

In the report of the Council's activities reference was made to a proposal to arrange an examination with a view to a Diploma for members. A Sub-Committee has been appointed to consider the matter and is drawing up a definite scheme.

The Council agreed that further inquiry should be instituted into the effects of the financial stringency upon developments in street lighting and that data should be collected comparing the population and expenditure on public lighting during the last three years in various towns and cities.

The Council approved the nomination of Mr. Alexander Forbes, of Aberdeen, as Vice-President for 1933-34, and an invitation had been received and accepted to hold the 1934 conference in Aberdeen.

Details were given of the Association's continued co-operation in the work of the National Illumination Committee of Great Britain, the Illuminating Engineering Society, the British Standards Institution, and the National " Safety-First " Association.

A specification for gas mantles is part of a large field of work being investigated by the joint Lighting Committee of the Institution of Gas Engineers. The Committee contained seven members of the Association, and a draft specification has been prepared.

The section on public lighting progress during 1932-33 contained a series of reports from members in various towns throughout the country. It was stated that the installation continues of directive reflectors and refractors, the tendency being strengthened by the compulsion, through financial stringency, to economize in the provision of closer spacing, and of adequate or pre-existing gas or electricity at the lighting points.

The call for economy is extending the use of automatic control, directly saving labour costs, and making it easier to extinguish a proportion of the lamps after part-night burning. On the other hand, in some areas the financial stringency has not prevented advance from part-night to all-night burning. This has been aided by cheaper gas or electricity.

Mr. H. C. BROWN, of London (Hon. Treasurer), presenting the accounts, said that they were satisfactory; in spite of rather heavy expenditure in connection with the Blackpool conference last year, a sum of £50 had been added to the Association's funds during the year. Membership had increased, and the attendance of delegates from the various towns of the country had been fully maintained.

Mr. R. WATSON (Doncaster), proposing the adoption of the report and accounts, said that the reports from members throughout the country had some satisfactory fea-

tures. In spite of the necessity for national and local economy during the past year, generally speaking there had been no reduction in the use of gas or electricity for street lighting, indicating the recognition by the Councils concerned of the importance of street lighting. There had been reductions in the prices of gas and electricity in many towns, but in the majority of cases there was no real reduction in the expenditure on lighting, which suggested that the money had been better spent and the lighting of the towns improved. One was glad to note the influence of the British standard specification, as indicated in the reports. There were indications of the use of larger lighting units, of increased heights of light sources, and better distribution of the light by means of directional reflectors and other appliances.

Mr. W. N. C. CLINCH (Brighton), seconding, suggested that some of the reports on the lighting of the various towns and cities might be more detailed. He mentioned particularly a statement in the report from Sheffield, to the effect that the adoption of automatic control was saving the city more than £12,550 per annum, and said he could not understand how that remarkable saving was effected.

The report and accounts were adopted unanimously, and thanks were accorded the Honorary Officers and Council, and the Secretary and his staff, for their work during the past year.

RE-ELECTIONS.

Mr. H. Davies (Chesterfield), Mr. S. B. Langlands (Glasgow), and Mr. T. Wilkie (Leicester)—all Past-Presidents—having retired from the Council, were re-elected.

THE 1934 MEETING.

Councillor A. REID (Aberdeen) extended formally to the Association, on behalf of the Town Council of Aberdeen, an invitation to hold the 1934 meeting in that city, and assured the members and delegates of a hearty welcome there.

The PRESIDENT intimated that the invitation had been accepted, and he repeated the expression of thanks which had already been made by the Council.

VOTES OF THANKS.

A hearty vote of thanks was accorded the Mayor and Corporation of Margate, and the Isle of Thanet Gas Light and Coke Company, for their hospitality to the Association during the meeting in Margate.

THE ASSOCIATION'S LUNCHEON.

The Association's Luncheon was held at the Queen's Highcliffe Hotel on Wednesday. The President, Mr. E. M. Severn, was in the Chair, and Mrs. Severn was also present. The guests included the Mayor and Mayoress of Margate, Mr. Walter Hills (Chairman of the Isle of Thanet Gas Light and Coke Company) and his co-Directors, Mr. J. M. Campbell (Engineer and General Manager, Isle of Thanet Gas Light and Coke Company) and Mrs. Campbell, and Mr. C. Valon-Bennett (Vice-President, Institution of Gas Engineers).

Mr. S. B. LANGLANDS (Past-President) proposed a toast to the President, and assured him of the members' wholehearted support during his term of office, which they all hoped would be a joy to him.

The PRESIDENT, in his response, said he hoped the coming year would be one of further prosperity for the Association. He also commented upon the fact that the meeting synchronized with a great improvement in the efficiency of electrical discharge lamps and a similar increase of efficiency in the new high-pressure gas lamps.

Mr. C. I. WINSTONE (London) proposed a toast to the guests. He thanked particularly the Mayor and Corporation of Margate and the Chairman and Directors of the Isle of Thanet Gas Light and Coke Company for their splendid hospitality to the Association during the meeting; and Mr. H. V. Emptage (Lighting Superintendent, Margate), Mr. Campbell, and Mr. J. A. Forde (Engineer, Isle of Thanet Electric Supply Company) for their great help in connection with the special displays of street lighting. To all the guests he offered a hearty welcome.

The MAYOR OF MARGATE, responding, paid a tribute to the work of the conference Committee, and said he was happy to know that, with the assistance of the officials of the town, the conference had been made a success. With regard to the Isle of Thanet Gas Light and Coke Company's officials, he said he had nothing but praise for the manner in which they worked for the community and did all they could for the Lighting Committee. The Chairman of the Lighting Committee was always kept fully acquainted with new developments; they were out to make Margate as good as any other town in the matter of illumination—and he believed they had succeeded.

A toast to Mr. J. S. Dow (Hon. Secretary of the Association) and his staff and a vote of thanks for their work in connection with the arrangements for the conference was also proposed by Mr. WINSTONE, and duly honoured.

The Public Lighting of Margate*

By H. V. EMPTAGE, Lighting Superintendent, Margate

Lighting committees and municipal authorities have sometimes been accused of lethargy in connection with the effective illumination of streets, but I would venture to say that this does not apply to either my Committee or my Council—having due regard to the old enemy "expense."

Let me illustrate this statement by a brief survey of recent developments.

In 1919 the town was provided with 1203 gas lamps and 24 electric lamps, the highest candle-power of the gas units being 300 and the electric 150. All the lamps were then in a more or less dilapidated state, as were also the services, &c., owing to their long disuse by reason of the war. For a few years efforts were mainly concentrated on gradually bringing the lamps back to something approaching efficiency. A large number of these lamps were fitted with the old upright "C" burners and were mounted in antiquated and heavy framed lanterns, some of them particularly ancient. The estimated candle-power at this time was 15,000.

In 1925 the first step towards improved lighting was taken. In that year the Gas Company conducted certain experiments and erected 9-light lamps to the existing columns on a portion of the main sea front road.

These columns were raised 3 ft. by means of extension pieces specially designed to match them, bringing the height to the source of light to 14 ft. 8 in. Eventually this type of lamp was adopted by my Committee and was erected on 12-ft. columns along the entire main sea front road. Later, the whole of the old-fashioned lanterns were removed and, together with those containing the old "C" burner, were replaced by modern square lanterns fitted with twin bijou mantles.

Further improvements were next made by fitting 5-light lamps to the existing columns in two of the principal thoroughfares and subsequently on the promenades at the west end of the town, the height to source of light being 12 ft. 8 in.

During the latter part of 1932, the principal shopping centre of Cliftonville (Northdown Road) was widened, and here a departure was made in the re-arranged lighting by the erection of 5-light lamps on 12-ft. columns giving a height of 14 ft. 8 in. to the source of light, and 9 lights on 15-ft. columns with a height to source of light of 17 ft. 8 in. These columns are of steel lined concrete and are rather pleasing to the eye.

At the present time the total number of public lamps in the Borough, both gas and electric, is 1833. The types in use are as follows:

Gas Lamps.

Twin burners in square lanterns	No.	1	mantles	1089
1-light suspension lamps	,,	3	,,	30
2-light suspension lamps	,,	3	,,	1
2-light suspension lamps	,,	2	,,	70
3-light clusters	,,	3	,,	209
3-light suspension lamps	,,	3	,,	24
5-light upright and suspension lamps	,,	2	,,	213
6-light suspension lamps	,,	2	,,	3
9-light upright and suspension lamps	,,	2	,,	152
15-light upright lamps	,,	2	,,	2
Total				1799

The estimated aggregate candle-power of the above is about 500,000, representing an increase of over three times since the termination of the war.

Electric Lamps.

100 watt.	4
150 watt.	24
300 watt.	2
500 watt.	4
Total	34

* From a paper read before the Association of Public Lighting Engineers, Margate Conference, Sept. 4 to 7.

The mileage of streets lighted by gas and electricity so far as public lighting is concerned is 50½.

The price of gas is 7½d. per therm less 5% for street lighting, and the declared calorific value 460 B.Th.U.

The price of electricity is 2½d. per unit for public lighting, and 7d. per unit to private consumers.

Renewals and Repairs.

The consumption of mantles per nozzle during 1932-33 amounted to 3·5.

This relatively high figure is explained by the 150 lamps on the sea front (mainly 5 and 9 light burners) which were extinguished during the winter and were re-lit several times; hence mantles which in the ordinary course would have been in use a considerable time, had to be renewed on each occasion. Weather conditions must also be taken into account, especially as a large proportion of the lamps are in very exposed positions.

The renewals of globes for gas lamps were distributed as follows:

1 light	10
2 ,,	37
3 ,,	15
5 ,,	27
6 ,,	2
9 ,,	33
15 ,,	1
Total	125

Thirty-seven electric lamps (comprising four 100 watt, three 300 watt, five 500 watt, and twenty-five of smaller size) and four globes were replaced.

The hours of lighting are 3509 per annum for all-night lamps and 1896 for "midnight" lamps (both gas and electric).

Automatic Controllers.

The whole of the lamps, both gas and electric, are fitted with clock controllers.

The town is divided into ten districts for winding, setting, cleaning, and general maintenance, the number of lamps allotted to each man being in accordance with the character of the district, its extent, and whether it is a scattered or compact one. The highest number of lamps allotted to one man is 209 and the lowest 122, but this man also acts as foreman and gives general assistance and advice to the others. The duties of each man also includes the inspection of their lamps at lighting-up time each night (Sundays included) to ensure that everything is in good order before departure.

The controllers are wound and set weekly in accordance with a schedule prepared by me. Lamps at dangerous corners, bends, &c., are left alight all night, the remainder being extinguished at midnight.

The adoption of automatic control has led to a reduction in mantle usage, and has contributed to the efficiency of the general lighting and greater cleanliness of lamps.

It has also been brought to the notice of the ratepayers, by the fact that, in spite of the continual growth of the town owing to the opening of new estates, &c., and the consequent increased demand for lighting, the rate for this service has diminished, being for the present year 5·91d., as compared with 8½d. in the £ previously.

Lanterns fitted with twin burners and directional reflectors are now being fitted in certain busy thoroughfares, and it is hoped gradually to extend this system, which has proved very satisfactory, in other important roads, and in time to the whole of the town.

Spacing of Lamps.

The standard spacing adopted in Margate for ordinary street lighting is 45 yards apart staggered, but in actual practice this rule is not rigid, and lamps are erected according to the requirements of the road concerned.

Mounting Heights.

The mounting heights adopted are in general as follows:

Twin burner lamps			11 ft. 6 in.	to source of light
3-burner ditto			11 ft. 6 in.	,, ,,
3- ,,	suspension lamps		11 ft. 6 in. to 14 ft. 0 in.	,, ,,
5- ,,	lamps		12 ft. 8 in.	,, ,,
9- ,,	,,		14 ft. 8 in.	,, ,,
15- ,,	,,		15 ft. 6 in.	,, ,,
5- ,,	,,	concrete columns	14 ft. 8 in.	,, ,,
9- ,,	,,	,,	17 ft. 8 in.	,, ,,

Lighting of Seaside and Health Resorts*

By W. N. C. Clinch, Engineer and Manager, Electricity Department, County Borough of Brighton

The lighting of streets and promenades has not been given that consideration which is due. Often such lighting is considered a luxury and even an unnecessary luxury. Proper lighting of roads is in itself an attraction, a wise expenditure readily repaid, and not only a considerable factor of safety to the users of the roads, but also an addition to the amenities in the towns and villages of this country.

Decorative Lighting.

As an addition to the provision of utility lighting, consideration should be given by the authorities of seaside and health resorts to the desirability of making their towns attractive not only during daytime, but at eventide, thereby meeting the requirements desired by the holiday takers. Holiday making is not a luxury, but a necessity if the standard of health is to be maintained or improved.

Members of this Association will doubtless share the view that, in addition to being Public Lighting Engineers, they can serve as creative and artistic experts engaged in the search for new ideas and means of applying them. They must have the taste and the judgment to ascertain and meet public wishes (which are so seldom known) and at the same time furnish seaside illuminations such as will attract an extensive variety of visitors.

Applications of Schemes.

Let us now consider various methods of application. The average utility lighting of the streets should be of a better standard than that of a similar size inland town. Also, the hours of use of such lighting should be continued for as long as possible, so that the town itself maintains the desired spirit of cheerfulness.

In the general lighting scheme of the streets, provision should, as far as possible, be made whereby this additional and decorative lighting can be easily carried out and such supplies as are necessary, readily afforded. Consideration should also be extended to the effective blending of decorative lights with the more permanent illuminations of the town. Although a well lighted sea-front (or a town's shop window, as it is so often called) is attractive and renders superfluous the use of head-lights on motor cars, the combination of special lighting-effects therewith requires careful study. For example, steps should be taken to avoid too great a contrast between the high intensity utility lighting and that intended for artistic purposes. Despite this reservation, the lighting engineer must not be absorbed in efficiencies or mean spherical candles when desiring decorative lighting schemes. In such cases the desire for even illumination does not, as a rule, arise, as each subject must be treated individually.

The use of floodlights can result in highly effective displays. The floodlighting of ancient and historical buildings, cathedrals, churches, artistic buildings, and monuments is worthy of consideration. In addition hotels which have pleasing elevations can be floodlighted with success. The floodlighting of cliffs and even of the sea itself, if skilfully carried out, is a further possibility, as bathing under such conditions is enjoyable. The delightful environs to which I have referred lose their shroud of darkness and may be made artistically attractive by means of illumination, thus extending, visually, the beauties of Nature over much longer periods.

Discussion.

Mr. S. B. Langlands (Past-President), of Glasgow, who referred to the papers of Mr. Emptage and Mr. Clinch as being complementary, remarked that in the floodlighting of the past there had been far too much harshness and far too little light and shade, but we were moving towards the making of real pictures by means of light, and he hoped that in future floodlighting would be a thing of beauty. Towns such as Brighton and Margate could be rendered doubly attractive by means of light.

Mr. J. W. Partridge (Chief Engineer in Charge of Street Lighting, Paris) said that public lighting was being done excellently in England, and much could be learned from it.

Mr. W. J. Jones (Electric Lamp Manufacturers' Association Lighting Service Bureau) said that the lighting of seaside resorts provided a great deal of scope for lighting engineers with artistic temperaments. It was necessary to introduce light and

* From a paper read before the Association of Public Lighting Engineers, Margate Conference, Sept. 4 to 7.

shade not only into our floodlighting schemes but also into the general illuminations at any seaside resort. A small resort on the Isle of Wight, which he had visited recently, and which had only half a mile of foreshore, had done well in the matter of illumination; his only grouse was that the whole town was plunged into darkness at 11 p.m. It seemed a parsimonious outlook on the part of the authorities at a seaside resort, who were anxious to attract visitors, to put the lights out at 11 p.m. He emphasized that all-night lighting, whether by gas or electricity, could be provided at very little extra cost, and urged the Association to consider the possibilities of providing all-night lighting in towns up and down the country, and in seaside resorts particularly during the season. By making such resorts light festivals they would make a tremendous appeal to the public, and those resorts would gain fresh income as the result of skilled investment in illumination.

Prof. E. W. MARCHANT (President, Institution of Electrical Engineers) emphasized that the authorities at Blackpool appreciated the value of lighting; it had been stated that, for the purpose of seeing the illuminations there last year, 2000 special train loads of people and 300,000 or 400,000 visitors had travelled there. Such facts, he urged, should be impressed upon the authorities of seaside towns, so that they might appreciate the financial benefits which accrued from the effective use of lighting, both for decorative and for other purposes. He understood that Blackpool was one of the lowest-rated boroughs in the country; to what extent that was due to effective lighting he did not care to say, but he suggested that lighting had played no small part in that result.

Mr. C. HARPER (Barking), commenting on a statement in the paper by Mr. Emptage, to the effect that, in spite of the growth of Margate, and the consequent increased demand for lighting, the rate for this service had diminished, said he did not see why an increase of the lighting rate should be expected as the size of the town increased. With regard to decorative lighting, he emphasized that tawdry erections, having a crude appearance, should be avoided, and said that in one seaside town he had visited a certain tower had been spoiled by tawdry electrical decorations around it. Finally, he suggested that it would be helpful if some of the data given in the papers could be connected up with British standard specifications, so that comparisons could be made of the lighting referred to and that of other towns.

Mr. JUSTUS ECK (London) agreed with Mr. Langlands that more contrasts were necessary in the floodlighting of buildings; many of them were given a flat appearance. He condemned the application of the word "floodlighting," because it seemed to give the impression that every object treated should be flooded out with light; he had discovered, by practical experiments in the illumination of gardens, that beautiful results could be obtained with a very small amount of illumination. The art of lighting should be studied; there was no great expense entailed, either in capital outlay or in maintenance.

Mr. R. J. JENKINS (Portsmouth), who had visited Paris at the time of the Colonial Exhibition there particularly to see the lighting, said that many of the buildings there had been illuminated by artists.

Mr. CLINCH, in his reply to the discussion, said he had not made reference in his paper to British standard specifications because he did not know of any standard specification which dealt with beauty. [Laughter.] Referring to all-night lighting, he said that no doubt Mr. Jones' remarks in that connection applied only to utility lighting; it was advantageous to maintain it all night. Commenting on Mr. Justus Eck's remarks, he said he had stated in the paper that lighting for decorative purposes must be carried out by an artistic expert.

Shipping, Engineering, and Machinery Exhibition

Though gas itself can hardly be described as playing an important part at the Shipping, Engineering, and Machinery Exhibition, which was opened at Olympia by the Earl of Athlone on Sept. 7, nevertheless a number of firms well known in the Gas Industry took part, and a brief description of some of the plant and appliances displayed by them may be of interest to our readers.

SOME OF THE EXHIBITS.

Messrs. Babcock & Wilcox, Ltd., are showing a full size section of the standard B. & W. marine boiler, with Bailey furnace and Erith-Roe retort type stoker. This exhibit is similar to the boilers ordered recently for the London, Midland, and Scottish Railway Company's cross-channel steamer for the Stranraer-Larne route, which will be the first British cross-channel ship to run completely on mechanically fired boilers. Also shown is a full-size corner section of a hopper bottom pulverized fuel fired furnace of Bailey construction, and an exhibit of the recently-introduced Babcock & Wilcox process of fusion welding.

The British Scientific Instrument Research Association demonstrate a new apparatus devised by them which measures the thickness of iron or steel plates accessible from one side only—for example, those of gasholders, boilers, &c. The apparatus consists of a horseshoe electromagnet with a torsion magnetometer in the yoke. With suitable D.C. excitation the intensity of the flux in the yoke depends on the thickness of the plate to which the electromagnet is applied. The scale of the magnetometer is graduated to give a direct reading of this thickness.

Messrs. Davey, Paxman, & Co., Ltd., exhibit their heavy-duty Diesel engines for marine propulsion and auxiliary duty. They are built on the Monobloc principle; operate on the 4-stroke cycle; are totally enclosed, and embrace many unique features. Being constructed to run for very long periods under any conditions, all working parts are totally enclosed by light covers which prevents the ingress of any dust, moisture, or spray. Although totally enclosed, instant accessibility to the working parts is assured by the removable covers. Paxman heavy-duty Diesel engines embrace all those essential features of design and construction which render them permanently reliable, self-contained, automatic in action, and trouble free to the user, and are made in a range of sizes for stationary, marine, traction, and portable purposes.

Messrs. Engineering Products, Ltd., exhibit the following: Mechanical Section: (1) "Ace" dial indicators reading in half-thousandths, ten-thousandths of an inch, and one-hundredths of a millimetre. The cases are made of one solid pressing, proof against oil, dust and damp, and rough usage. The stem is hardened and ground with hardened ball point. (2) Measuring instruments—calipers, measuring tables, thickness and depth gauges, &c. (3) Pratt grinding gauge.—This instrument measures while the piece is being ground and saves 40 to 60% in grinding time, and makes inspection unnecessary.

Messrs. Fescol, Ltd., exhibit articles treated by the "Fescol" process of electro-chemical deposition, as used by the shipping and engineering industry. The metals deposited are nickel, chromium, and cadmium, and these are employed to give protection against corrosion, to salve worn parts by restoring an amount to compensate for wear, and to give increased durability of surface. Chromium in particular is recommended where a low coefficient of friction is desired.

A range of patent incandescent general heat treatment furnaces—one gas fired in operation—is to be seen on the stand of the Incandescent Heat Company, Ltd., together with a range of burners for gas and other fuels.

The "Super" gas-fired furnace shown in operation is of the semi-muffle recuperative type measuring 24 in. by 18 in. by 12 in., and having a temperature range up to about 1200° C. on natural draught. A special feature of this furnace is the low radiation loss and the high heat transmission in the recuperators. This type of furnace has been installed for such work as carburizing, re-heating, tempering, normalizing, annealing, and hardening, and for special process work where temperatures must necessarily be maintained over long periods within critical limits. An automatic controller is fitted, which ensures correct regulation of the gas, secondary air supply, and damper adjustment to suit temperature variations, and in a predetermined proportion to maintain a given atmosphere in the chamber. The system of firing this type of furnace not only ensures absolute uniformity of temperature over the entire area of the working chamber, but also enables the furnace to be operated with an open aperture without impairing this condition within.

This firm are also showing examples of carburizing pots, &c., manufactured by their "Strongweld" process, in addition to pyrometer indication equipment and temperature control apparatus.

METERING EQUIPMENT.

A comprehensive range of metering and control equipment covering a very wide field of application and including among other interesting features the firm's latest developments in boiler control apparatus, is shown by Messrs. George Kent, Ltd. Under this heading is shown master controllers, fuel-air ratio controllers, and panels of boiler instruments, including pressure, temperature, and draught recorders and indicators. In addition to the above exhibits the stand includes a variety of meters for water, steam, compressed air, oil, gas, &c., including Venturi flow meters suitable for various purposes, such as water-works, sewage works, boiler feed, &c.; also mechanical meters for district supplies, service mains, and domestic purposes; steam meters for power stations and ships, and process steam meters; electrical transmitters and receivers for distance recording; and the latest types of controllers for flow, pressure, and temperature.

The Lea Recorder Company Ltd., exhibit a number of

interesting specialities including various types of their well-known Lea recorders, for measuring water and sewage over weirs and in flumes, and particularly their patent compound recording and integrating machine; water level indicators and recorders of new designs for use in connection with reservoirs; water level recording and measuring apparatus, electrically operated to transmit readings any distance; Lea coal meters for chain grate stokers, and for mechanical stokers, in connection with Lancashire type boilers; also the new " Romer-Lea " chain-operated meter for measuring coal and other materials in closed chutes. Numerous photographs, models, and diagrams are also shown.

Together with various types of searchlight projectors, the London Electric Firm are exhibiting examples of self-sustaining winches, contact suspension gears, and all-metal flexible couplings.

Morris Motors, Ltd., are exhibiting an industrial engine, non-clutch type, side valve, 100 mm. bore by 112 mm. stroke, 4-cylinder of 3518 cubic centimetres capacity, horse-power 30, single jet carburettor, magneto, industrial type fan and water pump, governor, detachable head, mounted in angle iron framework, with radiator, petrol tank, &c., the whole erected on channel bars extended to the rear for carrying machinery to be driven, specially suitable for making up self-contained lighting sets and the like. There is also an industrial engine suitable for lighting sets, driving compressors, adaptable for artesian well drilling rigs and the like.

A further exhibit is an industrial engine of the non-clutch model with reducing gear of 2 : 1 ratio, for use where a low speed of rotation is required, suitable for conveyors, and the like. A similar industrial engine is fitted with a friction clutch, and is particularly suitable for machines which require intermittent operations, such as winches, hoists, and, when allied with a 2 : 1 reducing gear, is specially suitable for light locomotives. It has also been very generally used for driving compressors.

The stand of Murex Welding Processes, Ltd., is of original design depicting welding and cutting as carried out in a modern shipyard. Actual demonstrations of welding for ship construction are given. Exhibits include electric arc welding plant and various examples of oxy-coal gas cutting machines. Samples of electrodes manufactured by the Company are shown. A special feature is made of those electrodes which have obtained the approval of Lloyd's Register of Shipping.

Industrial Instruments.

The exhibit of Messrs. Negretti & Zambra comprises some of the well-known instruments made by this firm for marine and industrial use—mercury-in-steel dial thermometers for steam, water, oil, and air temperatures. Rigid stem, distance pattern, and edgewise types are shown. Special attention should be given to the new temperature-recording instrument of this type, which has been called the " Mersteel." It has been designed to give equal accuracy and reliability to the previous recorders, but at a more economical price. Also shown are electrical resistance indicators centralizing a number of readings at one point; thermocouple indicators, single and multipoint types for furnace temperatures and high ranges generally; recording thermocouple pyrometers and electrical resistance recording thermometers, including a new 6-point recorder for any temperatures up to 2550° F. (1400° C.), automatic temperature controllers (high-range), operated on the thermo-electric principle for temperatures up to 2550° F. (1400° C.), and automatic temperature controllers (low-range), operated by the mercury-in-steel thermometer movement in conjunction with a diaphragm valve controlled by compressed air are also exhibited. Other instruments shown are recording absolute vacuum gauges, flow operated cut-outs, and dial and liquid gauges for indicating contents of fuel tanks.

Messrs. Reavell & Co., Ltd., show a representative selection of their air compressors and exhausters, suitable for land and marine use. These include a complete range of auxiliary compressors of the two-stage vertical type, having capacities from 10 to 200 c.ft. per minute suitable for working pressures up to 450 lbs. per sq. in. Also another series of machines of the same general type, but suitable for pressures up to 1000 lbs. per sq. in. and having capacities from 5 to 140 c.ft. per minute. There are also examples of the double-acting compressors built by this Company, for working pressures of 120 lbs. per sq. in., the model shown being of 1000 c.ft. capacity. The Company also specializes in the production of compressed air winches, windlasses, and steering gear.

Chain Drives for Power Transmission.

The Renold and Coventry Chain Company, Ltd., are showing a variety of chain drives for power transmission. The range of Renold chain drives covers every conceivable power transmission application and existing applications cover loads ranging from fractional to 1200 H.P. Complete chain drives covering loads up to 100 H.P. are available from stock. Chain clutches, which involve an entirely new principle in design, and chain couplings are also shown. The neat and attractive design of these couplings with their aluminium covers will be quickly appreciated. The complete stock range covers loads up to 600 H.P. A remarkably neat and efficient system for the remote control operation of clutches and other units is demonstrated. Also exhibited are speed transformers, which involve the application of standardized chain drives enclosed in well-designed cast iron casings. They cover a wide range of horse-powers and are equally efficient whether used for increasing or decreasing speeds.

Sheepbridge Stokes Centrifugal Castings Company, Ltd., exhibit typical components in special alloy cast irons, manufactured either by their centrifugal process of casting where cylindrical shapes are required or as sand castings for more complex shapes. They also exhibit examples of machined components, notably Diesel engine and pump liners. In addition, examples are shown of the firm's various heat treatment processes, including oil and air hardening and nitrogen hardening.

Safety Apparatus.

Messrs. Siebe, Gorman, & Co., Ltd., again exhibit a wide range of their specialities, including diving apparatus, pumps, air compressors, helmets, dresses, &c., and other submarine appliances. " Proto " and " Salvus " types of self-contained oxygen breathing apparatus for work in irrespirable atmospheres, as extensively adopted by rescue stations, collieries, fire brigades, steamships, oil companies, iron and steel works, &c.; the " Antipoys " fresh air breathing apparatus for use by men working in noxious and poisonous atmosphere within short distances of fresh air; largely adopted by gas undertakings for men working about street mains, &c., and by oil concerns for tank cleaning operations. Other types of oxygen administration apparatus are also included—" Spirelmo " smoke helmets of various patterns, as installed in steamships, oil tankers, oil depôts, collieries, gas-works, &c.; " Puretha " and other types of gas masks for use in known poisons. Also exhibited are dust masks of various patterns, safety goggles and gloves, protective clothing, acid-proof, water-proof, and fire-proof, safety lamps, oil and electric, gas analysis apparatus, first-aid outfits, fire extinguishers, and other safety and protective devices.

A complete range of their lubricating equipment for vessels, plant, and machinery of every description is being shown by Messrs. Tecalemit, Ltd. Besides the range of hand guns and nipples already well known, a number of new and interesting developments are exhibited. Lubrication of remote bearings, such as stern posts, propeller shafts, derrick jibs (to mention a few items), by high-pressure pipe lines, has been greatly extended both for hand operation and mechanical drive for oil and grease. Labour saving apparatus for clean and efficient handling of lubricants has been further developed, and hand operated and mechanically driven central lubrication for all classes of engines, gear and machine tools, is catered for in a comprehensive range of new equipment. Filtration of fuels and lubricants for internal combustion engines has been greatly improved upon, and fuel pumps for various types of engines will be included in the range of equipment shown. A further new item of interest is the highly efficient pull-and-push control, which has already been widely adopted.

Messrs. United Water Softeners, Ltd., exhibit one of the latest type automatically-controlled Base Exchange water softening plants of the industrial type, together with one of their standard 4 ft. diameter Base Exchange water softening plants for manual operation. This plant is fitted with the non-corrodible brine tank and an arrangement for syphoning the brine solution into the softener. It is specially notable for the fact that it occupies the minimum ground space, and is most suitable for confined situations. They are also showing one of the Lassen Hjort patent automatic measuring apparatus for the accurate measurement of water, together with the simultaneous measurement and addition of the necessary treating reagents.

Messrs. H. Windsor & Co., Ltd., exhibit " KaBe " acid-resisting products, and show a range of their acid, alkali, oil, and water resisting products which are in use in all parts of the world for the linings of pickling and acid storage tanks and the construction of floor linings suitable for resisting corrosive liquids and heavy wear. In addition to the above, a small section of circular construction is shown illustrating the Zeta patent method of bonding which enables structures such as chimneys, flues, acid and alkali towers, &c., to be built or lined of materials resistant to corrosive liquids, &c., and at the same time light in weight

and as strong as or stronger than normal constructional methods. Paints, tiles, cements, pastes, &c., for resisting the attacks of acid, alkalies, and oils are also shown. The range of these products is very extensive and practically any problem of corrosion by aggressive liquids can be solved by the use of one or other of these materials.

It may be mentioned that official visits to the Shipping, Engineering, and Machinery Exhibition were paid by the Institution of Gas Engineers and the Society of British Gas Industries (Sept. 8); the Institution of Engineers-in-Charge (Sept. 9); and will be paid by the Institute of Fuel, the Institution of Chemical Engineers, the Institution of Heating and Ventilating Engineers, and the London and Southern District Junior Gas Association (Sept. 14); the Association of Public Lighting Engineers and the Illuminating Engineering Society (Sept. 22).

Gas Companies' Results.

Coatbridge.

In submitting the statement of accounts and balance-sheet of the Coatbridge Gas Company for the year ended June 30, 1933, the Directors report that the sales of gas for the twelve months amounted to 1,290,906 therms. The Directors recommend the payment of final dividends at the rates of £9 5s.% actual on the original stock, and £6 9s. 6d.% actual on the four issues of £10 shares, all less income-tax.

Cork.

The 129th Ordinary General Meeting of the Cork Gas Consumers' Company was held at the offices, South Mall—Mr. Wm. B. Harrington, F.C.S., Chairman, presiding. Moving the adoption of the report and accounts, the Chairman said that notwithstanding the difficult conditions prevailing, the results of the half-year's trading were quite satisfactory, and there had been an increase in the sales of gas when compared with the corresponding period last year, which were the largest they ever had. "It is an interesting fact," continued the Chairman, "that since the June half-year, 1898 (the period immediately before electricity was first publicly supplied in Cork), our June half-yearly sale of gas has increased by 104 million c.ft., equal to 86%., a definite proof that we have more than held our own against all competition. The annual provision for payment of rates and taxes provides a striking example of the differences in conditions then and now. In 1898, with income tax at 8d. in the £, rates and taxes only cost us £2434, whereas for the year 1932, with income tax at 5s., and the necessity for providing for two years' Corporation Profits Tax, we had to set aside the sum of £15,430 for rates and taxes, while in addition £3565 had to be paid for the December half-year alone for emergency duty on coal, making a huge total of £18,995. We sold during the past 12 months 640 additional cooking stoves, 219 additional heating stoves, 230 additional laundry irons and boiling rings, 70 additional hot water apparatus, 5 additional refrigerators, 4044 additional lighting burners, and we had an increase of 642 consumers."

Rushden and Higham Ferrers.

The Directors of the Rushden and Higham Ferrers District Gas Company recommend the payment of a dividend for the half-year ended June 30, 1933, at the rate of £15 10s.% per annum on the original ordinary stock and of £10 17s.% per annum on the additional ordinary stock.

Corporation Undertakings' Results.

Aberdeen.

The output of gas has been raised by 24 million c.ft., bringing the total output up to 1730 millions—the highest in the history of the Department. Incidentally, it may be of interest to note that the output of gas has been doubled during the last 20 years. The revenue for the year at £248,334 shows a decline of £2000, due to the more generous scale of rebates for large consumers instituted last year. The gross surplus on the year's working, amounting to £56,254, is up £8000, attributable to economies in expenditure on coal, purifying plant, and general repairs, and to the estimate of revenue from gas consumers—coke, tar, and bye-product liquor being exceeded. This pleasing result enables the contribution towards the reduction of capital indebtedness to be increased from £15,318 in the estimate to £26,019 actual, after meeting all statutory obligations. The capital expenditure of the Department now stands at £703,232, of which sum no less than £84,807 has been met from revenue during recent years—the increase for the year being £6255. The total assets of the Department (including the cost of the works) amount to £877,699, while the liabilities only reach a total of £376,351, leaving a surplus of assets over liabilities of £501,348.

Lurgan.

Mr. W. Tallentine, the Gas Manager, came in for a number of complimentary references at the last meeting of Lurgan Urban Council, at which the report from the auditor in respect of the gas-works showed that the net profit on the past year's working was £109, as against a loss the previous year of £600. The Chairman (Mr. H. C. Malcolm) remarked that this was due to more gas being manufactured, overhead charges coming down, and, in fact, all the charges being reduced. Mr. Hopps suggested that the Council should reduce the price of gas to 4s. in face of the report.

By Appointment
Ironfounders to H.M. The King.

Practical proof of the Merits of

CARRON

GAS

Manufactures is to be found in their adoption in HOUSING SCHEMES throughout the Country.

Write for Gas Fire Catalogue No. 6M

CARRON COMPANY
ESTABLISHED 1759 FOUNDED 1795

Works - CARRON, STIRLINGSHIRE

Showrooms: LONDON — 15, Upper Thames Street, E.C.4; also at LIVERPOOL—GLASGOW—EDINBURGH—BRISTOL.

No. 1145G.—GAS MANTEL REGISTER, having 9 radiants, finished fine cast and blacked or painted one coat, also finished in metallic enamel, in imitation wood. Size 24" wide × 41" high.

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The large profit-taking movement which commenced the previous week extended to the first few days of business last week. There are no signs, however, of any set-back to the improved conditions, though the substantial appreciations in value which have taken place during the past few months in many of the leading industrial shares have almost discounted any advantages which may accrue through the hoped-for improvement in trade. There were some large buyers in the market for British Funds which, together with other safety-first securities, were also well supported by smaller investors, and prices almost reached the highest of the year.

In the Gas Market ordinary stocks were again prominent and prices still further advanced. The demand is such that investors are willing to pay top prices for high-class investments in order to get a slightly higher yield than that obtainable on gilt-edged securities, and gas ordinaries have now reached a figure when the yield in some instances is only a few shillings more than that obtainable on debenture stocks.

The largest gains last week occurred in Mid-Southern District "C" with a rise of 9 points to 112½; Brighton 6%, which rose 6½ points to 162; Imperial Continental, with a gain of 5 points to 230; and European, with a 4 points rise to 144½. Gas Light units advanced a further 6d. to 26s. 9d.

At the time of writing the available supplies of ordinary stocks are still very short of the demand. Gas Light units are on offer at 27s. 3d., yielding £4 2s. 2d., and Imperial Continental at 232, yielding £5 3s. 5d. In addition to these, a parcel of Colombo £1 shares is on offer at 32s. 6d., at which price the yield on a 10% basis works out at £6 3s. A dividend of 10% has been paid on these shares since 1923, and, in addition, a capitalized bonus of 33⅓ was distributed in 1925 and one of 25 in 1928. Another offer is that of £1727 Mirfield Gas stock at 109 *ex* div., the yield in this case being £4 16s. 3d. on the basis of a 5¼% dividend, the rate paid for the past two years.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Sept.* 11.

There are few changes to report in the prices of tar products, which are as follows:

Pitch, 80s. per ton f.o.b.

Creosote, 3d. per gallon.

Refined tar, 4d. to 4½d. per gallon in bulk at makers' works.

Pure toluole is about 2s. 9d.; pure benzole, 1s. 9d.; solvent naphtha, 95/160, is steady at 1s. 7d. to 1s. 8d.; and 90/140 pyridine bases, 4s. 3d. to 4s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Sept. 11.

The average prices of gas-works products during the week were: Gas-works tar, 30s. to 35s. Pitch—East Coast, 72s. to 75s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 72s. to 75s.* Toluole, naked, North, 1s. 9d. to 1s. 10d. Coal-tar crude naphtha, in bulk, North, 6d. to 6½d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 10d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2d. to 2½d.; low gravity, 2d.; Scotland, 2d. to 2½d. Heavy oils, in bulk, North, 4d. to 4½d. Carbolic acid, 60's, 2s. 7½d. to 2s. 9d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Sept.* 9.

Inquiries are more plentiful, and quotations are fairly steady in all departments excepting road tar and pitch.

Crude gas-works tar.—The actual value is now 40s. to 45s. per ton *ex* works.

Pitch.—Buyers' ideas are much below those of sellers. To-day's export value is round 70s. to 72s. 6d. per ton f.o.b. Glasgow. In the home market, about 75s. per ton *ex* works is still quoted.

Refined tar to Ministry of Transport Specification is offered at 3¼d. per gallon *ex* works in buyers' packages.

Creosote oil continues firm, and prices show an increase. B.E.S.A. Specification is 3d. to 3¼d. per gallon; low gravity, 3d. to 3¼d. per gallon; and neutral oil, 3d. to 3¼d. per gallon—all in bulk *ex* works.

Cresylic acid.—Prompt supplies are not so plentiful, and values are a shade firmer. Pale, 97/99%, is 11d. to 1s. per gallon; dark, 97/99%, 9d. to 10d. per gallon; and pale, 99/100%, 1s. 2½d. to 1s. 3½d. per gallon—all f.o.r. in buyers' packages.

Crude naphtha.—Value is steady at 4¼d. to 4¾d. per gallon *ex* works in bulk, according to quality and quantity.

Solvent naphtha.—90/160 grade is 1s. 4d. per gallon with supplies scarce. 90/190 heavy quality is on offer at 1s. per gallon.

Motor benzole.—Price remains nominal at 1s. 5d. per gallon *ex* works.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole . . .	0 9	to	0 9½	per gallon at works
Motor ,, . . .	1 4	,,	1 4½	,, ,, ,,
Pure ,, . . .	1 7½	,,	1 8	,, ,, ,,

Trade Notes.

Motors for Dusty Situations.

A leaflet has been issued by Lancashire Dynamo and Crypto, Ltd., dealing with gas-works electrical motors for all dirty and dusty situations. The small extra cost, it is claimed, is amply repaid by the immunity from breakdown afforded by these dust-proof motors.

"Eroda" Firebars.

That from their present condition a very much longer life may be expected of "Eroda" firebars than of the firebars previously fitted is the opinion of the Engineer of a large provincial gas company, who has had two sets of these bars in almost continuous use since October, 1932, and June, 1933, respectively. He further states that up to the present time he has found them quite satisfactory both on natural and forced draught, and adds that clinkering has been made much easier and very much reduced in quantity, while a saving in fuel has also resulted. "Eroda" firebars are manufactured by Messrs. Furnace-Bars, Ltd., of Broad Lane Works, London, N. 15.

New Capital Issues.

Messrs. Sidney Flavel & Co., Ltd.—The continued progress of this firm is observed by a new share capital issue of £32,000. The whole of this issue is being taken up by the present Directors, Mr. Percival Flavel, J.P., Mr. Gilbert Flavel, and Mr. S. W. B. Flavel, thus retaining the business in the family.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

Issue. £	Share.	When ex-Dividend.	Dividends. Prev. Hf.-Yr. % p.a.	Dividends. Last Hf.-Yr. % p.a.	NAME.	Quotations Sept. 8.	Rise or Fall on Week.	Transactions Lowest and Highest Prices During the Week.
1,551,868	Stk.	Apl. 3	7⅞	7	Alliance & Dublin Ord. ...	120—130	...	...
374,000	"	July 10	4	4	Do. 4 p.c. Deb.	85—95	...	...
557,655	"	Aug. 28	7	7	Barnet Ord. 7 p.c.	154—159*	...	...
300,000	1	May 8	1/4⅜	1/9⅜	Bombay, Ltd.	25/—27/-	...	26/8—27/-
178,280	Stk.	Aug. 14	9½	9½	Bournemouth sliding scale	192—202	...	...
550,050	"	"	7	7	Do. 7 p.c. max. ...	163—168	...	...
489,160	"	"	6	6	Do. 6 p.c. Pref. ...	135—140	...	...
50,000	"	June 26	3	3	Do. 3 p.c. Deb. ...	74—79	...	...
162,025	"	"	4	4	Do. 4 p.c. Deb. ...	99—104	...	...
210,000	"	"	5	5	Do. 5 p.c. Deb. ...	120—126	...	...
357,900	"	Aug 28	7½	7½	Brighton, &c. 6 p.c. Con. ...	157—167*	+6½	162—165
540,000	"	"	6⅜	6⅜	Do. 5 p.c. Con. ...	143—146*	+3	147
195,500	"	"	6	6	Do. 6 p.c. B Pref.	134—139*	+3	134
1,487,500	"	July 24	5	5	Bristol 5 p.c. max.	111—112a	...	...
120,420	"	June 26	4	4	Do. 1st 4 p.c. Deb. ...	99—100a	...	...
217,870	"	"	4	4	Do. 2nd 4 p.c. Deb. ...	99—100a	...	...
328,790	"	"	5	5	Do. 5 p.c. Deb.	119—122a	...	...
885,000	"	Apl. 3	7	8	British Ord.	157—164	+2	157—159
100,000	"	June 26	7	7	Do. 7 p.c. Pref.	145—150	...	...
350,000	"	"	5½	5½	Do. 5½ p.c. Pref. ...	108—113	...	...
120,000	"	"	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...	...
450,000	"	"	5	5	Do. 5 p.c. Red. Deb. ...	103—113	...	...
160,000	"	June 26	5	5	Cambridge 5 p.c. Deb. ...	115—120	...	...
100,000	10	May 22	6	4	Cape Town, Ltd.	7—8	...	...
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref. ...	7—8	...	...
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb. ...	92—97	...	96
626,860	"	July 24	6	6	Cardiff Con. Ord.	117—122	...	...
237,860	"	June 26	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	"	Aug. 14	6½	5	Chester 5 p.c. Ord.	105—110 b	...	...
98,936	1	May 22	2/-	2/-	Colombo, Ltd. Ord.... ...	1⅞—2⅛	+⅛	...
24,500	1	"	1/4⅛	1/4⅛	Do. 7 p.c. Pref. ...	18/6—20/6	...	...
609,204	1	Mar. 20	/11'48	/11'48	Colonial Gas Assn. Ltd. Ord.	17/6—20/-	...	...
296,053	1	"	1/3'30	1/3'30	Do. 8 p.c. Pref.	1⅞—1⅞	...	...
1,796,955	Stk.	July 24	6½	5	Commercial Ord.	115—120	+1	118—120
475,000	"	June 12	3	3	Do. 3 p.c. Deb. ...	73—78	...	75½
265,272	"	Mar. 6	—	5	Do. 5 p.c. Deb. ...	120—125	...	...
807,560	"	Aug. 14	7	7	Croydon sliding scale ...	143—148	...	146
469,590	"	"	5	5	Do. max. div.	101—106	...	...
500,000	"	July 10	5	5	Do. 5 p.c. Deb.	120—125	...	...
542,270	"	Mar. 6	7	10	Derby Con.	155—165c	...	...
55,000	"	July 10	4	4	Do. 4 p.c. Deb.	93—98c	...	...
209,000	"	Aug. 28	5	5	East Hull Ord. 5 p.c.	105—110*	+1	110
179,500	"	Aug. 28	6	6	East Surrey Ord. 5 p.c. ...	120—125*	...	...
155,019	"	June 26	5	5	Do. 5 p.c. Deb. ...	117—122	...	118
1,002,180	"	Apl 3	15	17	European, Ltd.	142—147	+4	142—147
19,373,992	"	Aug. 14	5⅞	5⅞	Gas Light & Coke 4 p.c. Ord.	26/8—27/8f	+/6	26/6—27/-
2,600,000	"	"	8½	8½	Do. 8½ p.c. max.	83—86	...	84—85½
4,477,106	"	"	4	4	Do. 4 p.c. Con. Pref. ...	100—103	...	101¾—102½
6,102,497	"	June 12	3	3	Do. 3 p.c. Con. Deb. ...	77—80	...	78½—79½
3,642,770	"	"	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	118
3,500,000	"	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—116	+1	113½—114½
270,466	"	Aug. 28	6	6	Harrogate New Cons. ...	120—125*	...	...
82,500	"	Aug. 28	7	7	Hastings & St. L. 5 p.c. Conv.	135—140*	...	...
258,740	"	"	5½	5½	Do. 3½ p.c. Conv.	108—113*	...	...
140,000	1	Apl. 24	110	110	Hongkong & China, Ltd. ...	28/— 30/-	...	28/-
218,200	Stk.	Aug. 14	6	6	Hornsey Con. 3½ p.c. ...	120—125	...	122—122½
5,600,000	"	May 22	10	14	Imperial Continental Cap.	225—235	+5	224½—230
223,130	"	Aug. 14	3½	3½	Do. 3½ p.c. Red. Deb.	89—94	...	...
235,242	"	Aug. 14	8⅜	8⅜	Lea Bridge 5 p.c. Ord. ...	167—172	...	168
2,145,907	"	Aug. 14	6	6	Liverpool 5 p.c. Ord. ...	125½—126½b	+½	...
245,500	"	June 26	5	5	Do. 5 p.c. Red. Pref. ...	103—113b	...	...
306,083	"	July 17	4	4	Do. 4 p.c. Deb. ...	99½—101½b	...	...
165,736	"	Aug. 28	10	8	Maidstone 5 p.c. Cap. ...	177—189*	...	...
56,176	"	July 10	3	3	Do. 3 p.c. Deb. ...	69—74	...	...
75,000	5	June 12	110	110	Malta & Mediterranean ...	9—11	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	...	...
231,978	Stk.	Aug. 28	5	5	M. S. Utility "C." Cons. ...	110—115*	+9	...
818,657	"	"	4	4	Do. 4 p.c. Cons. Pref.	91—96*	..	94—96
112,126	"	June 26	4	4	Do. 4 p.c. Deb. ...	100—102	...	...
148,955	"	"	5	5	Do. 5 p.c. Deb. ...	113—118	...	...
675,000	"	21 May '31	16	16	Montevideo, Ltd.	55—65	...	57
2,061,315	"	Aug. 14	5⅔	5	Newcastle & Gateshead Con.	24/6—25/-d	+/1½	...
682,856	"	"	4	4	Do. 4 p.c. Pref. ...	98—100d	...	...
776,706	"	July 10	3½	3½	Do. 3½ p.c. Deb. ...	91—93d	...	...
277,285	"	May 8	5	5	Do. 5 p.c. Deb. '43...	107—109d	...	...
274,000	"	Aug. 14	5	5	Newport (Mon.) 5 p.c. max.	100—102a	...	...
204,940	"	Aug. 28	7½	7½	North Middlesex 6 p.c. Con.	144—152*	...	...
396,160	"	Aug. 14	5	5	Northampton 5 p.c. max. ...	101—106	...	...
300,000	"	Apl. 24	9	7	Oriental, Ltd.	114—119	...	...
316,617	"	June 26	8	8	Plym'th & Stonehouse 5 p.c.	166—171	...	...
504,416	"	Aug. 28	8	8	Portsm'th Con. Stk. 4 p.c. Std.	158—165*	...	...
241,446	"	"	5	5	Do. 5 p.c. max. ...	102—107*	...	...
114,000	"	Aug. 14	5	5	Preston 5 p.c. Pref.	101—106	...	...
686,312	"	July 24	4	4	Primitive 4 p.c. Rd. Db. 1911	86—91	...	86
389,813	"	June 26	4	4	Do. 4 p.c. Cons. Deb.	82—87	...	82
150,000	10	Mar. 20	6	6	San Paulo 6 p.c. Pref. ...	6⅞—7⅛	...	...
1,736,968	Stk.	Sept. 5	6	6	Sheffield Cons.	127—130e	...	...
95,000	"	July 10	4	4	Do. 4 p.c. Deb.	90—94e	...	...
133,201	"	Feb. 20	8½	5	Shrewsbury 5 p.c. Ord. ...	135—140	...	...
90,000	10	June 12	15	14	South African	3—5	...	...
6,709,895	Stk.	Aug. 14	7	5	South Met. Ord.	126—151	+1	128—130½
1,135,812	"	"	6	6	Do. 6 p.c. Irred. Pf.	134 - 139	...	138
850,000	"	"	20/-g	4	Do. 4 p.c. Irred. Pf.	99—103	+1	102
1,895,445	"	July 10	3	3	Do. 3 p.c. Deb. ...	76—79	...	...
1 000,000	"	July 24	5	5	Do. 5 p.c. Red. Deb.	112—116	+2	113¾—114½
209,820	"	Aug. 14	8½	8½	South Shields Con.	146—149d	...	...
1,543,795	"	Aug. 14	6	6	South Suburban Ord. 5 p.c.	122—127	...	126
300,000	"	"	5	5	Do. 5 p.c. Pref.	111—116	...	112
300,000	"	"	—	4	Do. 4 p.c. Pref.	93—103	+1	121½—122¾
868,837	"	June 26	5	5	Do. 5 p.c. Deb.	118—123	...	...
100,000	"	"	—	—	Do. 4 p.c. Deb.	102—105	...	...
647,740	"	Aug. 28	5	5	Southampt'n Ord. 5 p.c. max.	106—111*	...	109
121,275	"	June 26	4	4	Do. 4 p.c. Deb.	99—104	...	...
350,000	"	Aug. 28	5½	5½	Swansea 5½ p.c. Red. Pref.	107—111*	...	...
200,000	"	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	103—108	...	...
1,076,490	"	Aug. 14	6⅔	6⅔	Tottenham and District Ord.	145—150	+1	148½
300,000	"	"	5½	5½	Do. 5½ p.c. Pref. ...	121—126	...	...
62,235	"	"	5	5	Do. 5 p.c. Pref. ...	108—113	...	...
199;005	"	June 12	4	4	Do. 4 p.c. Deb. ...	96—101	...	...
85,701	"	Apl. 3	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	80—85	...	...
347,769	"	Aug. 28	7	7	Uxbridge, &c., 5 p.ct. ...	144—149*	...	146—147
88,330	"	"	5	5	Do. 5 p.c. Pref. ...	108—113*	...	...
1,322,220	"	July 10	7	7	Wandsworth Consolidated	145—150	...	149
1,096,373	"	"	5	5	Do. 5 p.c. Pref.	113—118	...	117
1,317,964	"	June 26	5	5	Do. 5 p.c. Deb.	118—123	...	...
158,400	"	Aug. 28	6h	5	Winchester W. & G. 5p.c. Con.	107—112*	...	...

Quotations at:—a.—Bristol b.—Liverpool. c.—Nottingham. d.—Newcastle. e.—Sheffield. f.—The quotation is per £1 of stock. g.—For quarter. h.—Paid £3, including 10s. on account of back dividends. i The interest due 1/7/33 was paid on that date. * Ex. div. † Paid free of income-tax. ‡ For year. Hongkong & China, Ltd.—paid on £10 shares.

STOCK FOR SALE BY TENDER.

BOGNOR REGIS GAS AND ELECTRICITY COMPANY.

NEW ISSUE OF ORDINARY CAPITAL.

NOTICE is Hereby Given that it is the intention of the Directors of the above Company to OFFER FOR SALE BY TENDER such an amount of ADDITIONAL ORDINARY CONSOLIDATED STOCK "A" as will not exceed, including Premiums, the sum of £14,820 0s. 11d. ranking for a Standard Dividend of Five per cent. per annum subject to the Sliding Scale, equally with the existing similar Stock, which has for the last five and a half years received a dividend of Eight per cent. per annum.

Minimum price of issue, £160 per £100, yielding at that price £5 per cent. per annum.

Prospectus and Form of Tender (which latter must be received at the Company's Offices, as under, by noon on Monday, the 18th September, 1933) may be obtained from the undersigned or from the Company's Bankers, WESTMINSTER BANK, LTD., BOGNOR REGIS.

By order of the Board of Directors,
FRANK G. WATSON,
Secretary.

Gas and Electricity Offices,
Argyle Road,
Bognor Regis,
Sept. 2, 1933.

TROTTER HAINES, & CORBETT LIMITED
BRETTEL'S ESTATE
FIRE-CLAY & BRICK WORKS
STOURBRIDGE

Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST FURNACE BRICKS, LUMPS, TILES, and every Description of FIRE BRICKS.
Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.
SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

LONDON OFFICE: E. C. BROWN & Co., LEADENHALL CHAMBERS, 4, ST. MARY AXE, E.C

OVER
150
ENGINEERS
Purify
66,000,000,000
cub. ft. of coal gas
per annum
with
OUR
OXIDE

MANCHESTER OXIDE CO. LTD.
MILES PLATTING, MANCHESTER
Telegrams: Oxide, Manchester
Telephone { *2283* } *Collyhurst*
{ *2284* } *Manchester*

AN APPEAL TO ALL THERMS

JOIN THE

A&M

SQUAD

Sergt. A. & M. Meters has room for more Therms in his famous squad. Conditions of Service are severe. Therms are required to obey the Sergt. implicitly, and he is most critical. There is, however, compensation in the fact that every Therm is paid in full for every job he does.

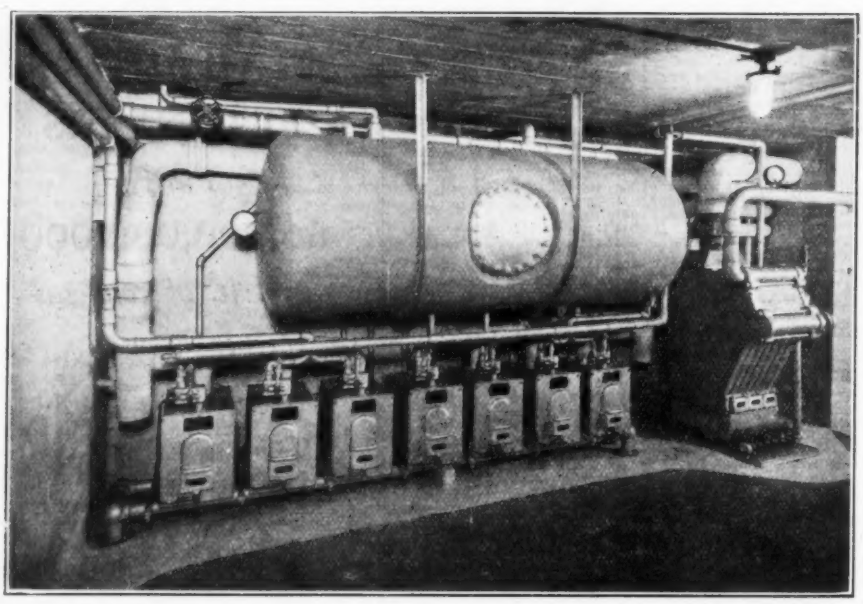
Will you allow Sergt. A. & M. Meters to control your Therms?

ALDER & MACKAY LIMITED

MAKE METERS OF METICULOUS MEASUREMENT

ALDER & MACKAY LTD., EDINBURGH, LONDON & BRANCHES.

GAS-FIRED EQUIPMENT FOR SPORTS PAVILIONS, INSTITUTIONS, &c.



An example of the high-efficiency Apparatus installed for hot water equipment in the Dressing Rooms of the Sports Club at the White City Stadium, Wood Lane, Shepherd's Bush.

Boiler Plant in the new Dressing Rooms for the Athletic and Football Meetings, comprising a battery of three No. 2 "EMPIRE" Boilers and a battery of four ditto, for the bathing pools and shower and lavatory basins respectively, while the R.7 "VICTOR" Boiler (capacity 170,000 B.Th.U.) is installed for warming this building with Low-Pressure Hot Water.

•

Complete Installations of Hot Water Supply, Heating and Allied Equipments undertaken under the supervision of Competent Engineers.

CATALOGUES UPON REQUEST.

Potterton "Empire" and "Emperor" Boilers are supplied on simple Hire by the Gas Light and Coke Company and many other undertakings.

THOMAS POTTERTON (HEATING ENGINEERS) LTD.

CAVENDISH WORKS, RAVENSWOOD ROAD, BALHAM, LONDON, S.W.12

Telephone: Balham 1244-5-6. *Telegrams:* Potterton, Bal, London.

PUBLISHERS' NOTICE.

TO CORRESPONDENTS: No notice can be taken of anonymous communications, unless authenticated by the name and address of the writer (not necessarily for publication).

TO ADVERTISERS.

NOON ON TUESDAY is the latest hour for receipt of advertisement copy for the following day's issue.

FIRST POST ON MONDAY is the latest for receipt of alterations of standing advertisements.

RATES FOR UNDISPLAYED ADVERTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum 4s. 6d. An additional charge of 6d. is made where replies are addressed c/o the "JOURNAL."

Full Schedule of Advertising Rates on application.

TERMS OF SUBSCRIPTION.

United Kingdom and Ireland	Advance Rate	35/- per annum. 18/- per half year.
	Credit Rate	40/- per annum. 21/- per half year.
Dominions and Colonies ...		35/- per annum, in advance.
United States (through United States Agent)		$8.50 per annum, in advance.
Other Countries in the Postal Union.		40/- per annum, in advance.

A copy of the "G.J." Calendar and Directory is presented to Continuous Subscribers.

UNITED STATES.—Renewals after December, 1931, and all new subscriptions in the United States, to be made through ROBERT O. LUQUEER, Agent, WOOLWORTH BUILDING, NEW YORK, N.Y.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C. 4.
Telephone: Central 2236-7 (2 lines). Telegrams: "GASKING, FLEET LONDON."

FRESH OXIDE

SPENT OXIDE

GAS PURIFICATION & CHEMICAL COMPANY LIMITED,

PALMERSTON HOUSE,
34, OLD BROAD STREET,
LONDON, E.C. 2.

(ESTABLISHED 1873.)

Telegrams: "PURIFICATION, STOCK, LONDON."
Telephone: LONDON WALL 9144.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.

WET AND DRY GAS METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.

REPAIRS RECEIVE PROMPT ATTENTION.

Telephones:
Main (Oldham) 3815/6 and 2412 Hop, London.

Telegrams:
"BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

WEIGHBRIDGES

FOR Motor Lorries and Railway Traffic can be seen erected at our Works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.

CHARLES ROSS, LIMITED,
SHEFFIELD.

OXIDE OF IRON.

SPENT OXIDE BOUGHT.

BALE & CHURCH, LTD.,
33, ST. MARY-AT-HILL, LONDON, E.C. 3.
Phone: Royal 1484.

"TORTO" FIRE CEMENT.

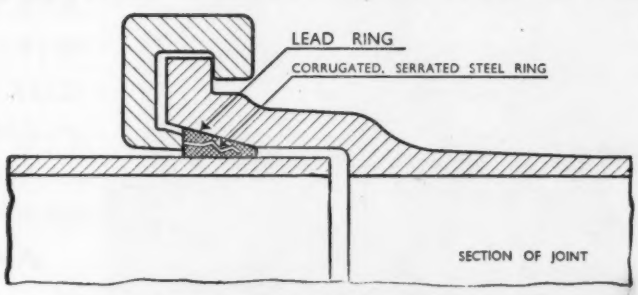
BALE & CHURCH, LTD.,
33, ST. MARY-AT-HILL, LONDON, E.C. 3.
Phone: Royal 1484.

"KLEENOFF," THE COOKER CLEANSER
Tins for Sale to Consumers.
In Bulk for Works Use.
(*See also p. 485 and the "Gas Salesman."*)

BALE & CHURCH, LTD.,
33, ST. MARY-AT-HILL, LONDON, E.C. 3.
Phone: Royal 1484.

The STANTON Mechanical Lead Joint

(Patent applied for)



NO INCREASED COST

This mechanically made joint works on a similar principle to the Stanton-Wilson Joint, but employs a lead ring in which is encased a thin corrugated, serrated steel ring. It is more flexible than a caulked joint and provides for expansion and contraction of mains—No skilled labour needed.

N.B.—Where a considerable degree of flexibility is required, use the Stanton-Wilson self-adjusting Joint, which has been adopted by over 200 Public Undertakings in this country.

The Stanton Ironworks Company Limited, Near Nottingham

ROBERT DEMPSTER & SONS, Ltd., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS, GASHOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. Telegrams: "DEMPSTER, ELLAND." Telephone: ELLAND 261 (Private Branch Exchange).

FIRTH BLAKELEY, SONS, & CO., LTD.,
Vulcan Ironworks, Church Fenton, Yorks.,
MANUFACTURERS of Gasholders, Tanks, Condensers, Purifiers, Scrubbers, Washers, and every description of Gas Plant.
Telegrams: "BLAKELEYS, CHURCH FENTON." Telephone: BARKSTON ASH 34 (Private Branch Exchange). Code: "BENTLEYS."

STRACHAN & HENSHAW LTD.
MANUFACTURERS **BRISTOL.**
and CONTRACTORS for
HANDLING PLANT,
SCREENS, TIPPLERS, ETC.

STEAM ENGINES FOR **GAS WORKS**
ASHWORTH & PARKER,
Riverside Works, Bury, Lancs.
(See illustrated advertisement Aug. 30, p. 436.)

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.,
99, LONDON ROAD, LEICESTER.
Telegrams: "BRIPURIMAT, LEICESTER." Telephone: LEICESTER 59086.

NATURAL BRITISH PURIFYING MATERIAL
AN ABSOLUTELY STANDARD PRODUCT.
MOISTURE GUARANTEED 28%
SUMMER AND WINTER.

"FIRST QUALITY" DUTCH BOG ORE
As supplied to most of the Principal Gas Works in Great Britain.

SPENT OXIDE PURCHASED.

EDUCATIONAL.

HOW TO BECOME A QUALIFIED GAS ENGINEER

THE T.I.G.B., the premier establishment for engineering training by correspondence, will train you until successful for:

Certificates of the Institution of Gas Engineers, A.M.Inst.C.E., A.M.I.Mech.E., A.M.I.E.E., C. & G., B.Sc. (Eng.) Lond. Univ., etc.

WRITE TO-DAY for FREE copy of "The Engineer's Guide to Success," 144 pages, which contains the widest selection of engineering courses in the world, and gives full information about the professional examinations open to you.
THE TECHNOLOGICAL INSTITUTE OF GREAT BRITAIN, 148, TEMPLE BAR HOUSE, LONDON, E.C. 4. (Founded 1917. 19,000 Successes.)

HUTCHINSON BROTHERS, Ltd.,
FALCON WORKS, BARNSLEY.
MANUFACTURERS OF
GAS METERS (Ordinary and Slot).
"FALCON" INVERTED LAMPS,
SQUARE STREET LANTERNS
SUPERHEATER BURNERS, and
CONVERSION SETS for Street Lanterns.

PATENTS.

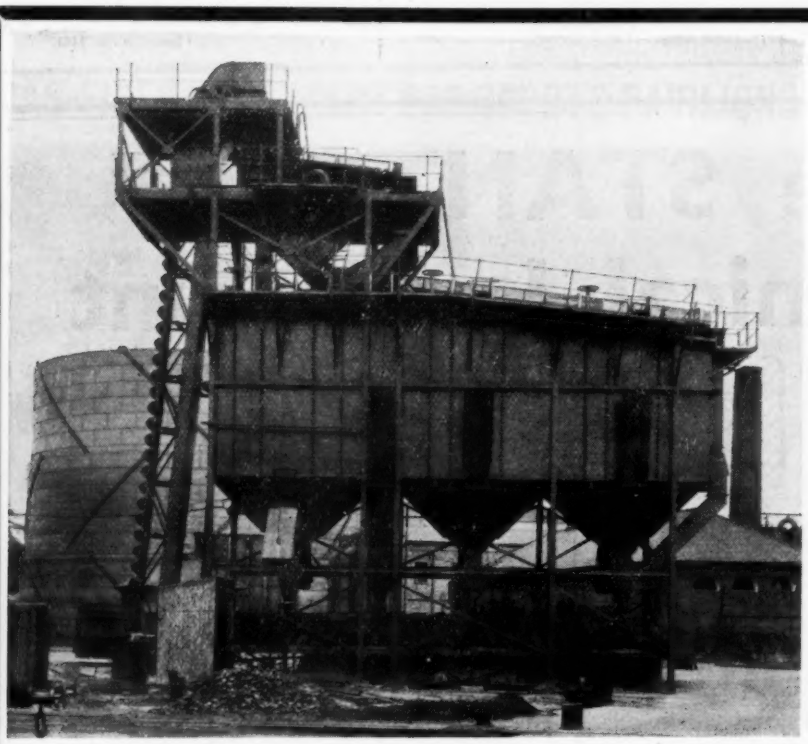
PATENTS for Inventions, Trade Marks "Advice Handbooks" and Consultations free. KING'S PATENT AGENCY LTD., Director B. T. KING, C.I.M.E., Regd. Patent Agent, G.B., U.S., and Can., 146A, QUEEN VICTORIA ST., E.C. 4, and 57, CHANCERY LANE (near Pat. Off.), LONDON, W.C. 2. 47 years' refs. 'Phone Cent. 0682.

MEWBURN, ELLIS, & CO.,
CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70 & 72, Chancery Lane, London, W.C. 2.
Telegrams: "Patent, London." 'Phone: 248 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

TARPAULINS.

TARPAULINS.—Second Hand Black Dressed, approx. 20 ft. by 14 ft., all thoroughly repaired, 25s. each. Redressed ditto, 30s. each. Carriage paid. Approval willingly. Thousands sold with full satisfaction. Cheapest makers new goods. Samples and lists on application.
S. H. LOMAS & CO., HIGH STREET, LONDON, E. 15.

(Continuation of small adverts. on p. 584.)



Modern Elevating, Breaking, Grading, & Bagging Coke Plant recently erected by R. & J. Dempster, Ltd.

COAL & COKE HANDLING

ARE YOU EQUIPPED WITH COAL AND COKE HANDLING PLANT TOGETHER WITH OTHER LABOUR SAVING APPLIANCES?

May we prepare a scheme to suit YOUR REQUIREMENTS

R. & J. DEMPSTER, LTD., MANCHESTER.

LONDON OFFICE: 34, VICTORIA STREET, WESTMINSTER, S.W.1.

ADVANCE IN GAS VALVE DESIGN!

"HOLMES" BROCHURE No. 8

Useful tables for reference

Copies of this Brochure have already been sent to all Gas Undertakings. We shall be pleased to forward additional copies for Staff use. Previous Technical Brochures issued in this series deal with:

STATION METERS AND LARGE CONSUMERS' METERS ("Connersville" Positive Displacement Type. See Brochure No. 6, Part I).

"CONNERSVILLE" EXHAUSTERS AND COMPRESSORS (No. 6, Part II).

"BRUSH" ROTARY WASHERS (see Brochure No. 2).

"D. & L." CENTRIFUGAL WASHERS.

"VICTOR" POSITIVE ROTARY BLOWERS (see Brochure No. C. 5).

PATENT "DRI-GAS" PLANTS (for removal of both Water Vapour and Naphthalene. See Brochure No. 4).

OIL REGENERATION PLANT (for recovery of Benzole and Naphthalene).

PURIFIERS AND GASHOLDERS.

TAR AND AMMONIA DISTILLING PLANTS.

WELDED AND RIVETED STEEL.

PIPES AND TANKS.

SPECIAL PIPES AND GENERAL CASTINGS.

In preparation:

"SUPER-TYPE" CONDENSERS.

GAS & LIQUOR COOLERS.

HOLMES
FOUNDED 1850
HUDDERSFIELD

85C

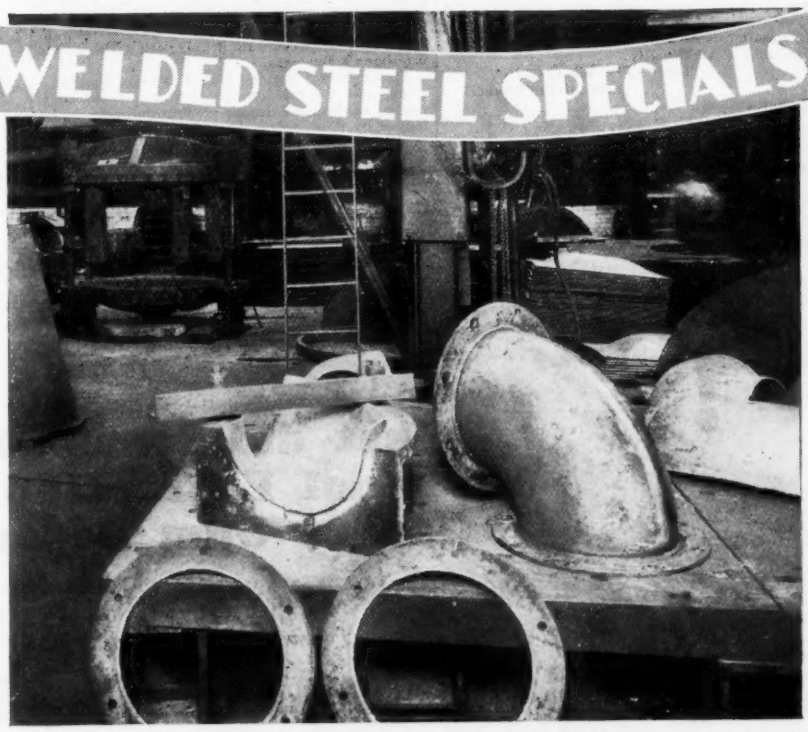
PRESSED & WELDED STEEL SPECIALS

A SPECIAL DEPARTMENT

of our Works is devoted to the production of welded or riveted steel mains, tees, die pressed bends, and other special pipes which are now being so extensively used for works connections and overhead by-passes, &c.

Having welded joints and flanges they have a good appearance and are light in weight and easily carried overhead.

(See page 23 of Brochure No. 8).



• Pressed Steel Pipes in course of manufacture in our Works.

86C

W. C. HOLMES & CO. LTD., HUDDERSFIELD

Telephone: Huddersfield 1573 (Private Branch Exchange). *Telegrams:* Holmes, Huddersfield

London Office: 119 Victoria Street, Westminster, S.W.1. *Telephone:* Victoria 4505. *Telegrams:* Ignitor, Sowest, London

APPOINTMENTS, &c., VACANT.

ILFRACOMBE GAS COMPANY.

ENGINEER AND MANAGER.

APPLICATIONS are invited for the Position of ENGINEER and MANAGER to the above Company.

Applicants must produce a First-Class Health Certificate, and must have had a good sound Technical Training and Practical Experience in Modern Methods of Manufacture and Distribution of Gas. Knowledge and Experience with Horizontal Retorts, Stoking Machinery, and Electrical Plant is essential. The Applicant must also have Experience of Competition with Electricity and Oil, and Commercial Ability is most desirable.

Commencing Salary, £600 per Annum, rising to £700 by annual increments of £25.

Age not to exceed 40.

Applications, stating Age, and giving full details of Training, Qualifications, and Experience, accompanied by *copies* of Three recent Testimonials, must be sent to the undersigned not later than Saturday, Sept. 23, 1933. Envelope to be endorsed "Engineer and Manager."

A NORMAN,
Secretary.

Gas Offices,
Ilfracombe,
Aug. 31, 1933.

MILFORD HAVEN URBAN DISTRICT COUNCIL.

GAS AND WATER ENGINEER AND MANAGER.

APPLICATIONS are invited for the Position of GAS and WATER ENGINEER and MANAGER to the above-named Council, at a commencing inclusive Salary of £280 per Annum, rising by annual increments of £20 to a maximum of £360 per Annum.

Applicants must possess a thorough knowledge of the Works of a Gas and Water Undertaking, and be prepared to assist in the clerical work and keeping of accounts governing his Department.

Applications, stating Age, Qualifications, and Experience, and the date upon which he can enter upon the duties of the office, accompanied by *copies* of not more than Three recent Testimonials, to be sent to the undersigned, endorsed "Gas and Water Engineer," not later than Saturday, the 23rd of September next.

Canvassing directly or indirectly is strictly prohibited and will disqualify.

THOMAS G. WILLIAMS,
Clerk to the Council.

Council Offices,
Milford Haven,
Sept. 1, 1933.

WANTED, by a Yorkshire Gas Undertaking, a Lady of Good Education, commanding presence and mature experience, to MANAGE the CENTRAL SHOWROOMS, Supervise the District Showrooms, Interview Customers, and Organize Lectures and Demonstrations in Cooking by Gas.

Applications, stating Age, Experience, Qualifications, whether Married or Single, and Salary required, to Box 700, L.P.E., 110, ST. MARTIN'S LANE, LONDON, W.C.

BOROUGH OF HEYWOOD (LANCS.).

APPOINTMENT OF GAS ENGINEER AND MANAGER.

APPLICATIONS are invited for the Appointment of GAS ENGINEER and MANAGER at a Salary of £400 per Annum, subject to a temporary economy deduction now in force.

Applicants must possess extensive knowledge and experience of Modern Gas Manufacture and Supply in all phases, including Vertical Retorts and Carburetted Water Gas Plant, and must be capable of undertaking all classes of Constructional Work connected with a Gas Undertaking, and must also possess sound Commercial Experience.

Applications (stating Age, present and previous Appointments, Qualifications and Experience, and accompanied by *copies* of Three Testimonials) must be received by the undersigned not later than Wednesday, the 27th September, 1933, endorsed "Gas Engineer and Manager."

Canvassing, directly or indirectly, will be a disqualification.

Applicants must be Members of the Institution of Gas Engineers.

GEO. G. BOUCHIER,
Town Clerk.

Municipal Buildings,
Heywood,
Lancs.

GAS Manager Wanted by the Forres Gas Light Company, Limited. Must be thoroughly qualified in Manufacture, Distribution, and Sales, and devote the whole of his time to the Company's Business.

Applications, stating Age, Training, Qualifications, and Experience, and when able to commence duties, and *copies* of Testimonials, to be lodged by Wednesday, 20th September next, with H. W. LEASK, Solicitor, FORRES.

APPOINTMENTS WANTED.

GAS Engineer, M.I.Mech.E., M.Inst. Gas E., and of American Gas Assoc., 46, wide experience organizing, commercial, and administrative work, keen, active, and adaptable. Experienced horizontal, continuous, and intermittent vertical retorts and vertical chamber ovens. Tar distillation to refined Benzole and production of disinfectants; repairs and testing of consumers' meters and appliances. Extensive high-pressure distribution, industrial applications of gas, and general propaganda work. Ten years Engineer and General Manager of Municipal Undertaking in England, nine years recent experience as Chief Gas Engineer of Financial Corporation operating gas undertakings abroad, where by active propaganda collective output was increased from 2098 million to 3831 million cu.ft. per annum. Well acquainted modern American and German technical and commercial practice; wide experience constructional work by direct labour; excellent record of results achieved. Displaced as result of amalgamation, seeks Position in Gas or Allied Industry.

Address, No. 8353, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

PLANT &c., FOR SALE & WANTED.

OWING to Dismantling of Works; in good running Condition when shut down:

- 2 B.D. Steam-Driven EXHAUSTER SETS, 40,000 c.f.p.h.
- 1 P. & A. TAR EXTRACTOR, 1½ m.c.f.p.d.
- 1 LIVESEY WASHER, ½ m.c.f.p.d.
- 1 LIVESEY WASHER, 1½ m.c.f.p.d.
- 2 Holmes ROTARY WASHERS with ENGINES, 8 bays 6 ft. diameter.
- 1 K.H. & C. ROTARY WASHER, 8 bays 5 ft. diameter.
- 49 Cort's ANTI-DIPS.
- 1 F. & A. CHARGING MACHINE.
- 2 B.D. Steam-Driven ROTARY COMPRESSORS, 12,000 c.f.p.h. at 3 lbs.
- 2 B.D. Gas Engine Driven ROTARY COMPRESSORS, 3000 c.f.p.h. at 2 lbs.
- 2 Gas Engine Driven ELECTRIC GENERATING SETS, 16 kw., 230 v. D.C.
- 3 10 h.p. 230 v. D.C. MOTORS.
- 1 13½ h.p. Ditto.
- 2 H. & G. C.W.G. Sets with TURBINE BLOWERS—
  - 1 250,000 c.f.p.d.
  - 1 425,000 c.f.p.d. (Back-Run).

For full details, apply ENGINEER, GAS-WORKS, DUDLEY. All to be seen at Brierley Hill, Staffs.

?

What did somebody say about Phenol Extraction, or Bottled Gas, or Gum Deposits in 1932?

is a question which is very likely to arise in your daily work. You may know the answer, if not, you will find it at once in the

TECHNICAL SIGNPOST

full particulars of which were given in the "Journal," July 26, page 193.

Price **3/6** post free.

Orders and Enquiries to
WALTER KING, LTD.
11, Bolt Court, Fleet Street,
London, E.C. 4

INDEX TO "JOURNAL" ADVERTISERS.

A

	PAGE
Abbott, Birks, & Co.	—
Aerograph Co., Ltd.	—
Alder & Mackay, Ltd.	580
Allan, Thomas, & Sons, Ltd.	—
Amal, Ltd	—
Anglo-American Oil Company, Ltd.	542
Arden Hill & Co.	—
Asbestos Cement Building Products, Ltd.	539
Ashmore, Benson, Pease, & Co., Ltd.	528
Ashworth & Parker	582
Assessment of Gas Undertakings	—
Astrah Products, Ltd.	—
Automatic Light Controlling Co., Ltd.	—

B

Bale & Church, Ltd.	581
Barclay, Andrew, Sons, & Co., Ltd.	—
Barrowfield Ironworks, Ltd.	—
Bates, J., & Sons	—
Blakeley Firth, Sons, & Co., Ltd.	582
Braddock, J. & J. Wrapper II.,	581
Bray, George, & Co., Ltd.	544
British Aluminium Co., Ltd.	—
British Furnaces, Ltd.	—
British Gas Purifying Materials Co.	582
British Steam Specialties, Ltd.	—
British Thomson-Houston Co., Ltd.	—
Broadbent, Thos., & Son, Ltd.	—
Broadhead Constructions, Ltd. Wrapper I.	
Brockhouse, J., & Co., Ltd.	—
Bugden, T., & Co.	548

C

C.C. Fire	—
Cambridge Instrument Co., Ltd.	—
Cannon Iron Foundries, Ltd. Centre VIII.	
Carron Company	577
Cellactite & British Uralite, Ltd.	—
Chemical Engineering and Wilton's Patent Furnace Co., Ltd.	—
Clapham Bros., Ltd.	586
Clayton, Son, & Co., Ltd.	538
Cochran & Co., Annan, Ltd.	—
Cookers & Geysers, Ltd.	—
Cort, Robert, & Son, Ltd.	—
Cowan, W. & B. Wrapper III.	
Crone & Taylor, Ltd.	—
Cutler, Samuel, & Sons, Ltd.	—

D

Davis Gas Stove Co., Ltd.	—
Dempster, R. & J., Ltd.	582
Dempster, R., & Sons, Ltd. Centre II.,	582
Denison, Saml., & Son, Ltd.	530
Diaphragm & General Leather Co., Ltd.	544
Donkin Co., Ltd. (The Bryan) Wrapper II.	
Drayton Regulator and Instrument Co., Ltd.	543
Dry Gasholders, Ltd.	534
Duxbury, Thomas, & Co. Wrapper I.	

E

E. B. Refractory Cement Co., Ltd.	529
Economic Gas Boiler Co., Ltd.	537
Electrolux, Ltd.	543
Evans, Joseph, & Son (Wolverhampton), Ltd.	525
Expanded Metal Company, Ltd.	530

F

F. C. Construction Co., Ltd.	—
Falk, Stadelmann, & Co., Ltd.	—
Fletcher, Russell, & Co., Ltd.	541
Foster & Pullen, Ltd.	546
"Four Oaks" Spraying Machine Co.	—
Fraser & Chalmers Engineering Works	545

G

Gas Chambers and Coke Ovens, Ltd.	—
Gas Meter Co., Ltd. Wrapper IV.	
Gas Purification and Chemical Co. Wrapper I.,	581
General Gas Appliances, Ltd.	551
Gibbons Bros., Ltd.	—
Gibbons (Dudley), Ltd.	—
Glenboig Union Fireclay Co., Ltd. Wrapper II.	
Glover, George, & Co., Ltd. Wrapper I.	
Glover, Thos., & Co., Ltd.	552
Goodall, Clayton, & Co., Ltd.	—
Grant, David, & Co.	—
Graphite Products, Ltd.	548
Gray, Jas. & Sons	—
Green & Boulding, Ltd.	—
Griffiths Bros. & Co. (London), Ltd. Wrapper I.	

H

Hanley, A.	—
Hardy & Padmore, Ltd.	—
Harper, John, & Co., Ltd.	—
Harris & Pearson, Ltd. Wrapper IV.	
Head, Wrightson, & Co., Ltd.	—
Holmes, W. C., & Co., Ltd.	583
Horseley Bridge and Engineering Company, Ltd.	—
Horstmann Gear Company, Ltd.	540
Humphreys & Glasgow, Ltd.	550
Huntington Heberlein & Co., Ltd.	529
Hurry Water Heater Co.	—
Hutchinson Bros., Ltd.	582

I

Institute of Chemistry	—

J

Jenkins, W. J., & Co., Ltd.	—
Johnson, C. H., & Sons Ltd.	—

K

Keith, James, & Blackman Company, Ltd.	586
Kempton, C. H., & Co., Ltd.	531
King, Walter, Ltd.	584
King's Patent Agency	582
Kirkham, Hulett, & Chandler, Ltd.	—
Kleenoff Co.	581

L

Laidlaw, R., & Son (Edin.), Ltd.	—
Lead Wool Company, Ltd.	—
Le Bas Tube Co., Ltd.	—
Lighting Trades Ltd.	—
Lomas, S. H., & Co.	582
London Electric Firm, The Wrapper II.	

M

Macpherson, Donald, & Co., Ltd.	525
Main, R. & A., Ltd. Centre VII.	
Manchester Oxide Co., Ltd.	579
McKelvie, James, & Co. Wrapper I.	
Mewburn, Ellis, & Co.	582
Mitchell, H., & Co. Wrapper I.	
Morris Commercial Cars Ltd.	535

N

National Enamels, Ltd.	—
New Conveyor Co., Ltd.	538
Newton Chambers & Co., Ltd.	—
Nobel Chemical Finishes, Ltd.	—

O

Orme, George, & Co.	532
Oughtibridge Silica Firebrick Co.	—

P

Parkinson Stove Co., Ltd. Centre III.	
Parkinson, W., & Co. 532,	552
Pass, E., & Co.	—
Patent Retorts, Ltd.	—
Peckett & Sons, Ltd.	548
Peebles & Co., Ltd.	547
Pegson, Ltd.	528
Pifco, Ltd.	—
Piggott, Thos., & Co., Ltd.	—
Potterton, T. (Heating Engineers), Ltd.	580
Pulsometer Engineering Co., Ltd.	—
Purimachos Ltd.	—

R

Radiation Ltd. Centre IV., V.,	541, 549
Reavell & Co., Ltd.	548
Richmonds Gas Stove Co., Ltd.	549
Robinson, J. H., & Co. (L'pool), Ltd.	—
Ross, Chas., Ltd.	581
Rotary Meter Company, Ltd.	—
Rotherham & Sons, Ltd.	—
Ruscoe, John, & Co., Ltd.	—

S

Sawer & Purves	—
Scottish Tube Co., Ltd.	—
Sheepbridge Coal and Iron Co., Ltd.	—
Siebe, Gorman, & Co., Ltd.	—
Simon-Carves, Ltd.	542
Sisson, W., & Co., Ltd.	—
Smith Meters, Ltd.	—
Solent Engineering Co., Ltd.	—
South Metropolitan Gas Company	—
Spencer-Bonecourt, Ltd.	—
Sperryn & Co.	—
Stanton Ironworks Co., Ltd.	581
Staveley Coal and Iron Co., Ltd.	—
Stein, J. G., & Co., Ltd.	—
Stephens, J. C., & Son, Ltd.	—
Stewarts and Lloyds, Ltd.	—
Strachan & Henshaw, Ltd.	582
Stringer Bros.	—
Sugg, Wm., & Co., Ltd.	527
Sutherland Meter Co., Ltd.	—

T

Thompson, J. (Wolverhampton), Ltd.	—
Tilley Bros., Ltd.	545
Torbay Paint Company, Ltd.	—
Trier Bros., Ltd.	—
Trotter, Haines, and Corbett, Ltd.	579
Tully Sons & Co., Ltd.	—
Turner, F. (Art Metal), Ltd.	—

V

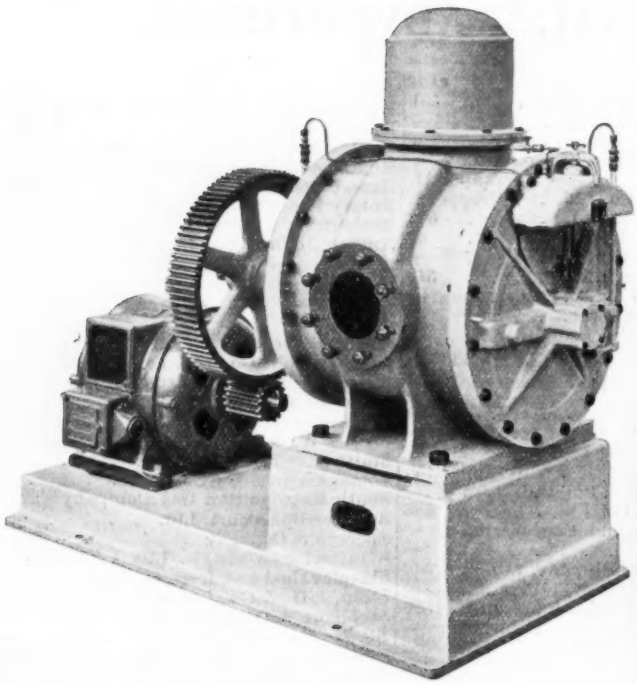
Vale, Thos., & Co., Ltd.	—
Valor Co., Ltd.	546
Vertical Gas Retort Synd., Ltd. Wrapper I.	
Vickers-Armstrongs, Ltd.	—
Visco Engineering Company, Ltd.	546
Vulcan Stove Co., Ltd.	533

W

Wakelin, F. H., Ltd.	—
Walker, C. & W., Ltd.	540
Walker, Crosweller, & Co., Ltd.	—
Waller, Geo., & Son, Ltd.	526
Waterless Gasholder Co., Ltd.	536
Wellington Tube Works, Ltd.	—
Welsbach Light Company, Ltd.	—
West's Gas Improvement Co. Centre X.	
Westwood & Wrights, Ltd.	—
Whessoe Foundry and Eng. Co., Ltd. Wrapper I.,	547
Willey & Co., Ltd. Centre VI.	
Williamson Cliff, Ltd. Wrapper IV.	
Wilson (George) Gas Meters, Ltd. Wrapper I.	
Wilsons & Mathiesons, Ltd.	—
Windsor, H., & Co., Ltd.	—
Withinshaw, A.	—
Woodall-Duckham Co., Ltd. Centre I.	
Wright, Alex., & Co., Ltd. Centre IX.	
Wright, John, & Co.	—

Appointments Vacant and Wanted	584
Company Notices	—
Contracts Open	—
Educational	582
Gas-Works Wanted	—
Patents	582
Plant, &c., for Sale	584
Publications	—
Stocks and Shares	579

ADVERTISEMENT INDEX



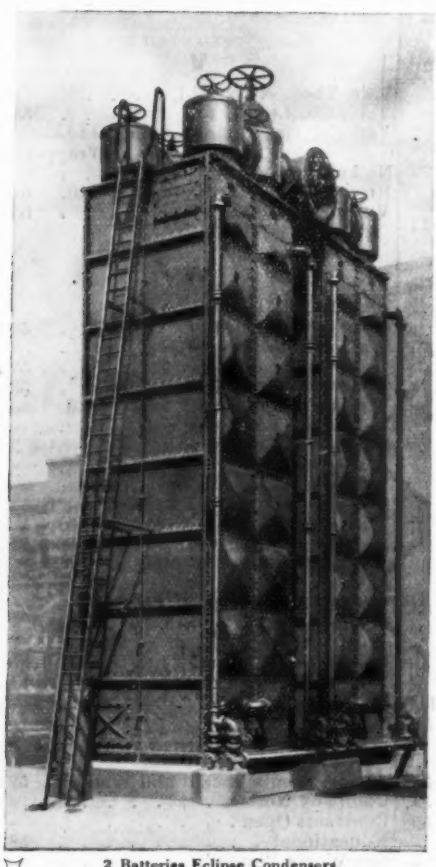
THE machine illustrated above is an "F4" Keith Rotary Compressor mounted on common cast-iron bedplate with protected type squirrel cage motor and having a capacity of 20,000 c.ft. per hour. The drive is through Lincarto pinion on motor and cast-iron machine cut wheel on compressor, the whole lined up on cast-iron base.

For raising the pressure of Air or Gas up to 5 lbs. per square inch . . . . .

KEITH Rotary COMPRESSOR

Full particulars, capacities and prices are in our List G57. Please write for a copy.

JAMES KEITH & BLACKMAN Co Ltd
Head Office :-
27, Farringdon Avenue, London, E.C.4.
Telephone: Central 7091. Telegrams: "James Keith, Phone, London



2 Batteries Eclipse Condensers.
Capacity, 8 Million cu. ft. per diem.

'ECLIPSE' CONDENSERS

CORRECT
IN
THEORY
AND
MECHANICAL CONSTRUCTION
BUILT BY

CLAPHAM BROS., LTD.

Telephone : Keighley 2787
KEIGHLEY
Telegrams : Clapham Bros. Ky.

Printed (at the Chancery Lane Printing Works, Ltd.), for WALTER KING, LTD., 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.—Wednesday, September 13, 1933.